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# A PRACTICAL TREATISE

ON

# DISEASES OF THE SKIN

BY

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Etc., Etc.

FIFTH EDITION REVISED AND ENLARGED

Illustrated with 29 Half-Tone Plates
Containing 40 Figures, Nearly All Original

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1909

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# PREFACE TO FIFTH EDITION.

A FIFTH edition of this work being demanded for some time the author has revised the text according to the decided progress made in this department of medicine. In addition to the numerous changes and additions, the author has kept in mind the needs of the active practitioner of medicine in the treatment of Diseases of the Skin. Therapeutics of the application of remedies to the treatment of these special diseases, have been particularly dwelt upon by the writer throughout the work. Thirty-four years' experience in private and clinical duties, together with teaching the student, has enabled the author to place all important and clinical facts well before the readers of this volume. It will be observed from a careful examination of the text, that the writer has given a full and thorough account of all well-known and accepted remedies in the treatment of diseases of the skin.

Electrotherapeutics has received especial attention, and much stress has been laid upon the value of the Roentgen ray in the diagnosis and the treatment of this class of diseases.

Many new additions have been made of plates of clinical cases and of pathological changes in the skin. The author is especially grateful to Dr. L. Napoleon Boston for his kind assistance upon many new pathological and bacteriological facts which are to be found under the respective diseases in the text. Professor M. B. Hartzell of the University of Pennsylvania has been both generous and kind and several of the most important plates in this volume have been furnished by his clinic.

Dr. Frank Woodbury, a very old friend and colleague, has likewise assisted the author by many suggestions during the time the book was passing through the press.

Cordial acknowledgment is also made for several illustrations modified and redrawn from Dr. J. M. H. McLeod's excellent work on the "Pathology of the Skin."

The author further desires to express just and grateful appreciation of the cordial manner with which the medical press and profession received the former editions of this work, and trusts that the present edition will likewise prove a welcome and faithful exponent of this special department of medicine.

JOHN V. SHOEMAKER,

1805 WALNUT STREET,
PHILADELPHIA, PA.

33257

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# DISEASES OF THE SKIN.

## PART I.

## GENERAL CONSIDERATIONS.

### THE ANATOMY OF THE SKIN.

THE cutis, or skin, is a firm, fibro-elastic, integumentary organ of membranous character, which forms the external covering of the body, and which is continuous at the natural orifices with the mucous membrane. It is varied in function and complex in organization; adapts itself by its flexibility and elasticity to the movements of the underlying structures; protects them from external irritation or injury; invests and supports the muscles and fascia; gives shapeliness and color to the body; and prevents the too rapid escape of fluids by evaporation or transudation from the soft parts beneath. It is of the utmost importance as an organ of sensation, absorption, secretion and excretion, and also acts as a regulator of the bodily temperature. The total area of the skin of an adult is approximately one and a half square metres.

The surface of the skin is grooved by a net-work of minute furrows, mostly parallel or concentric in their course, but which also cross each other at all angles. They correspond with the depressions between the papillæ of the corium. There are also larger furrows, which are especially noticeable on the back of the hand, where they divide the surface into a multitude of triangular or lozenge-shaped spaces. Larger ones, formed by the folding of the skin, are found on the face and neck, and around the joints. These wrinkles, especially upon exposed parts of the body like the face and hands, become more numerous and evident as age advances.

The surface of the skin is pierced by millions of minute openings, which are the orifices of the hair-follicles, and of the sebaceous and sudoriparous ducts. Hairs, coarse or fine, are found on every region of the skin, except the palms of the hands, the soles of the feet, and the dorsal surfaces of the last phalanges; also the muco-cutaneous structures, the conjunctiva and cornea, and the vermilion border of the lips; the clitoris, the glans penis, and the inner surface of the prepuce and the labia majora.

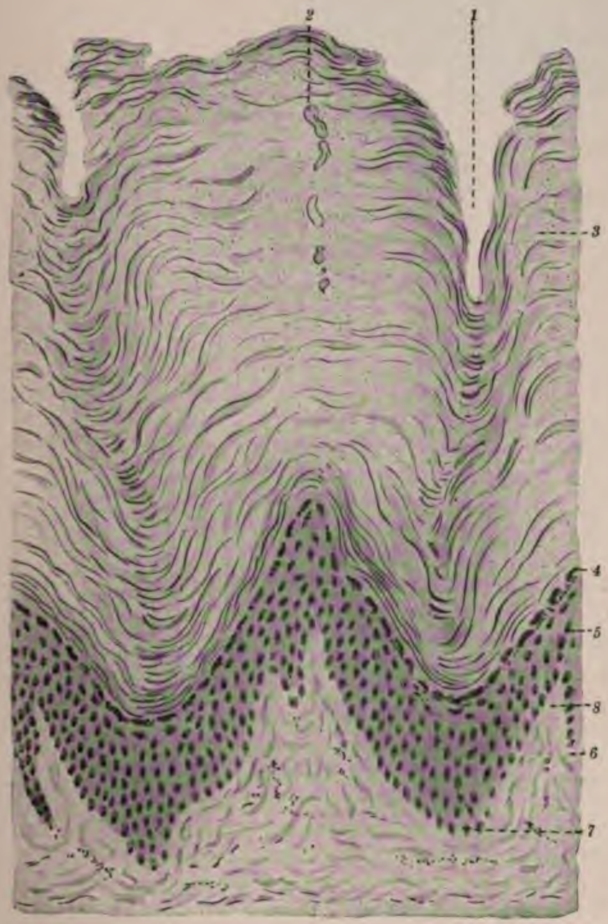
The color of the skin is largely due to the presence of a pigmentary substance, and it depends upon the quantity of this material present, and perhaps to some extent also upon its chemical composition. The typical racial differences, as well as the variations of complexion observed among individuals of the same race, depend upon the proportion and distribution of this material. In the Caucasian, or European race it is usually deposited in the greatest quantity in the areolæ of the nipples, in the axillæ, in the scrotum and labia, and around the anus. In the races dwelling in the tropics, there is a marked development of the pigment layer, which reaches its highest degree in the black, or Negro race. Brunettes differ from blonds in the greater proportion of pigment in the skin and the hair.

The skin varies in thickness in different parts of the body. It is thinnest on the eyelids and prepuce, and thickest on the back, buttocks, palms, and soles. Its attachment to the structures beneath it varies with the density of the areolar tissue and the amount of intervening adipose. In those portions of the body where the areolar tissue is compact, or where there is an abundance of fat, the connection is firm and close, as on the pubes, perineum, and back. Where great mobility is desirable, the areolar tissue is loose and contains little or no fat, as around the joints and on the eyelids. In these regions the attachment is comparatively slight, and the soft and pliant skin can easily be raised into folds between the fingers. Turner and other writers of the eighteenth century record the case of a Spaniard whose skin was so loose and elastic on the right side, that it could be drawn out from his body for twelve inches in any direction. An analogous case is that of Herr Haag, a native of Nuremberg, who has recently been on exhibition in the cities of Europe and the United States as "the India-rubber-skin man." This abnormality is only explicable on the supposition that there is a large increase of elastic tissue in the corium, and an absence of direct connecting fibres between it and the deeper structures.

A knowledge of the minute anatomy, as well as of the general structure of the skin, is necessary for a proper appreciation of the changes produced by disease. It is also of importance as a basis for the rational application of therapeutic measures. Some morbid conditions involve the skin in its entirety; others manifest no tendency to spread beyond the part in which they first appear.

The skin, or cutis, is composed of two principal layers: the epidermis, or the *epithelial* layer, derived from the ectoblast of the embryo, and the *connective-tissue* layer, which is developed from the mesoblast. The latter is called the derma proper, or the corium; each of these is formed by the aggregation of a number of primary layers. The line of demarcation between the epidermis and the corium is sharply defined. They can be detached from each other by maceration, and are separated by various morbid processes. The corium and subcutaneous connective tissue, on the

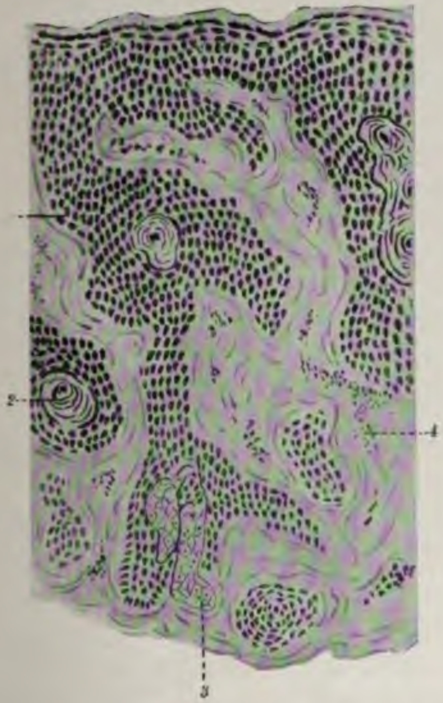
# PLATE I



Diagrammatic Sketch showing Vertical Section of the Skin of the Sole. (See page 2)

1. "Fine furrow" corresponding in position to an interpapillary process.
2. Sweat-pore.
3. Stratum corneum.
4. Granular layer.
5. Malpighian layer.
6. Basal layer.
7. Interpapillary process.

# PLATE II



Pseudo-hypertrophy of the Epidermis. Pavement Epithelium. (See page 3)

1, Basal layer has disappeared, and the cancerous cells are encroaching upon lymphatic spaces of the corium.
2, Cell-rests.
3, Sebaceous gland.
4, Corium showing infiltration.

contrary, merge imperceptibly into each other, the boundary-line between them being merely an arbitrary one. The skin is abundantly supplied with blood-vessels, lymphatics, nerves, and muscles, and is also provided with certain special appendages necessary for the performance of its functions, viz., sudoriparous and sebaceous glands, hair-follicles, hairs, and nails.

**The Epidermis.**—The epidermis, cuticle, or scarf-skin, is the most superficial portion of the skin. It is a laminated, slightly elastic membrane, composed entirely of epithelial cells and scales. It contains no blood-vessels, and is but scantily supplied with nerves, only a few filaments having been traced to its deeper layers. It covers the corium closely everywhere, and serves to protect that structure from external irritation or injury. It is pierced by the hair-follicles and the ducts of the sudoriparous and sebaceous glands, and is marked by a network of minute furrows which correspond with the depressions between the papillæ of the corium. The larger furrows found on the face and the neck, and in the vicinity of the joints, indicate the folds of the skin when not in motion. The epidermis consists of four separate layers: 1. Stratum corneum. 2. Stratum lucidum. 3. Stratum granulosum. 4. Stratum germinativum. The first two layers are frequently considered as one, denominated the horny layer; and the latter two likewise, as one, and styled the mucous, or germinative, layer. The *stratum granulosum, or intermedium,* lies between the horny and the germinative layer, and is the level at which the epithelial cells begin to flatten into horny plates. It is also the place where separation takes place when a blister is formed. In thicker portions of the skin, as on the palms and soles, the layers of the skin are well differentiated, showing all the layers, on vertical section, which may be taken as the type. Four layers are recognized, by good authorities, as existing in the epidermis, whether regarded from a pathological or a histological point of view.

The epidermis varies in thickness in accordance with the development of its various layers. It is thinnest about the lips and on the face, and thickest upon the palms and soles. It is usually from .08 to .10 mm. in thickness, being greater upon the flexor surfaces of hands and feet, where the corneous layer may be greatly increased in spots, so as to form callosities or corns. The coloring-matter of the epidermis is almost exclusively found in the stratum germinativum, or mucosum.

STRATUM CORNEUM (CORNEOUS LAYER).—This is the external or superficial layer of the epidermis. It is composed of several strata of flattened, transparent cells of various shapes and sizes. The cells of the deeper strata are polygonal or spindle-shaped, and are larger and more distinct than those above them. Some present traces of a nucleus, and can be stained faintly with carmine. The superficial strata consist of flat, polymorphous scales, which become more and more shrivelled in appearance and curved upon themselves as the surface is approached. They do not contain any nuclei. The stratum corneum varies in different portions of the body. It is thinnest on the lips and face, and thickest on the palms and soles. Its thickness does not depend on the development of the other layers of the epidermis. Ranvier has isolated from this layer a fatty substance, which is solid at ordinary temperatures and tends to defend the surface against moisture and chemical action.

STRATUM LUCIDUM.—The stratum lucidum, called also the stratum of Oehl, after its first discoverer, is the narrow, transparent layer of compressed cells found immediately beneath the stratum corneum. According to Unna it contains from four to six rows of cells that in fresh, unstained sections attract attention by reason of their extreme transparency. They are derived from the cells of the granular layer by the loss of that material and the increase in transparency of the rest of the cell-substance. Each cell contains a staff-shaped or flattened nucleus. This layer is deficient in other situations, and may be absent; but is always present in the palms of the hands and soles of the feet. Unna believes that this layer is merely a portion of the stratum corneum, and suggests that the title of stratum lucidum be abandoned, as incorrect and misleading.

STRATUM GRANULOSUM OR INTERMEDIUM.—The granular layer, or layer of Langerhans, consists of two or three rows of flattened, polygonal cells, which are situated immediately beneath the stratum lucidum. They were at one time supposed to be true connective-tissue corpuscles, because of their spindle-shaped appearance when a vertical section of this layer is made. Their long diameter is parallel to the surface of the epidermis. They are characterized by the presence around their nuclei of a number of minute granules of a substance known as eleidin, which, according to Ranvier, is a material intermediate in nature between protoplasm and keratin. It was denominated, by Waldeyer, keratohyalin, and is probably due to degeneration of nuclei of the cells, and indicates a transition stage toward cornification (Brunn). It is most abundant near the nuclei of the cells, and diminishes or disappears as the periphery is approached. Unna regards the presence and formation of the granules of this layer as a necessary step in the process of the development of the stratum lucidum and the stratum corneum. He believes that the color of the skin in the white race is also dependent upon the presence of these granules. They refract the light very strongly, and therefore appear white in a reflected light. Prior to their formation, the epidermis of the fetus is so transparent that the blood-vessels of the corium can be seen distinctly beneath it.

STRATUM GERMINATIVUM; STRATUM SPINOSUM; RETE MUCOSUM; RETE MALPIGHII.—The stratum mucosum, or mucous layer, called also the layer of Malpighi, is that portion of the epidermis which lies immediately above the corium; it is separated from it by a thin basement membrane. It adapts itself closely to the upper surface of the corium by means of its interpapillary processes, which fit into the depressions between the papillæ. It is composed of several layers of nucleated cells, which vary in size and shape. Those of the deepest layer are small and columnar, with oval nuclei, and are arranged with their long axes perpendicular to the surface of the corium. They are composed of granular protoplasm surrounding the nuclei, and have no distinct cell-wall. According to Biesiadecki and Henle, the outlines of the individual cells of this layer are obliterated occasionally, so that the surface of the corium appears to be covered with a mass of protoplasm containing a number of nuclei. The cells of the next two or three rows are larger and cubiform, or more or less polygonal, and the nuclei are spherical, well defined, and homogeneous in structure, are inclosed in a cell-wall or membrane, and contain granular and pigmentary matter. The cells of the superficial strata are still larger and more granular in appearance, but become flattened as they approach the upper layers, so that their long axes finally become parallel to the general surface of the skin. This is well shown in the preceding illustrations.

All the cells of the stratum mucosum, except the columnar of the internal row, are connected with each other by means of a series of minute fibrils of protoplasm. Schultz, who was the first to discover these connecting filaments, believed they were formed by the union of projecting processes from adjacent cells. In accordance with his view, this layer of cells is spoken of as the prickle layer, and the filaments are referred to as the prickles of Max Schultz. These prickles or fibrillæ vary in size in different parts of the body. Robinson says they are most distinct where the development of the mucous layer is perfect, and they are thicker and longer in the upper than in the lower strata. They are also found in the stratum granulosum, but are not present in the stratum lucidum. They are true connecting filaments, and, as asserted by Unna, are to be regarded as a system of protoplasmic fibrils which permit the free circulation of nutritive material through their interspaces, and effect a firm, but not unalterable, connection between adjacent cells.

Wandering cells, or lymphoid corpuscles, are occasionally found in this layer, especially in the lower and middle strata. Their number is small, however, in the normal healthy state, but they are considerably increased in various pathological conditions.

They are of an irregular or stellate form, and are known as Langerhans' cells. By some they are regarded as colorless pigment cells, and by others as connective-tissue corpuscles.

The stratum mucosum in color ranges from yellowish white to brown or black, dependent on race and the region of the skin. This is due to differences in the amount of pigmentary material present in the cells of this layer. When the skin is only slightly colored, the pigment matter is absent from all but the most internal stratum of cells. Darker shades are produced by its increased deposition and diffusion among two, three, or more strata.

**The Corium.**—The corium, derma, or cutis vera, is the most important and most highly organized portion of the skin. It is composed of a dense network of bundles of white fibrous tissue with which muscular elements and yellow elastic fibrillæ are closely interwoven. The interstitial spaces, which are much smaller than those of the subcutaneous connective tissue, diminish in size as the surface is approached. They contain lymphoid corpuscles as well as true connective-tissue cells. Fat-globules are also present.

This layer varies in thickness in different individuals and in different parts of the body. It is thinnest on the eyelids, the glans penis, clitoris, prepuce, and inner surface of the labia majora, where it ranges from 0.27 to 0.56 mm. On the face, the scrotum, and the areola of the nipples, it varies from .068 to 1.13 mm. On the forehead it is 1.50 mm. Its average depth on the general surface of the body is between 1.69 and 2.26 mm. It attains its greatest thickness on the sole of the foot, the back, and the nates, where its continuity is broken by the projection of a number of columns of fat, which extend from the subcutaneous connective tissue to the base of the follicles of the lanugo. In these regions it is frequently 5.5 mm. deep. The projecting columns of fat are of importance in supplying nutrition to the fine hairs. They also increase the flexibility of the integument, furnish a channel for the passage of the vessels, and serve as an outlet for various morbid products in disease. They have a special relation to certain pathologic conditions such as furuncle, carbuncle, and abscess of the skin. They were first described by Dr. J. Collins Warren, of Boston. The corium is richly supplied with arteries, veins, lymphatics, nerves, and muscular tissue. It is traversed by the follicles of the deep-seated hairs and the ducts of the sudoriparous glands. The sebaceous glands, and the follicles of the finer hairs, are embedded in its middle third.

The corium is divided for facility of description into the upper or papillary layer, and the lower or reticular layer. This division is, however, mainly an arbitrary one, and is based principally upon the greater size of the connective-tissue bundles in the lower strata and the consequent looseness of the network. The superficial portion is separated from the epidermis by a thin basement membrane, but the deeper one merges imperceptibly into the subcutaneous connective tissue.

STRATUM PAPILLARE OR CORPUS PAPILLARE.—The papillary layer is the superficial connective-tissue portion. It is distinguishable from the reticular layer only by the greater density of its structure. Its fibres are intricately bound together, and its interfascicular spaces are so minute that in many places it presents a perfectly homogeneous appearance. Its upper surface is roughened by the projection of millions of small but distinct prominences, termed the papillæ, from which this layer derives its name. They contain the terminal expansions of the cutaneous vessels and nerves, and are the most important constituents of the corium. They are ordinarily cylindrical or conical, but vary in size and shape, and also in number, in various regions. Occasionally they are club-shaped, or square and flattened. Those that arise from a separate base are termed simple papillæ, in contradistinction to the tufts of five or six which spring from a common trunk, and are called compound papillæ. They may be also divided into vascular and nervous papillæ. The former are provided with an afferent arteriole, or capillary plexus, and an efferent vein. The latter contain medullated nerve-fibres and one or more tactile corpuscles. In rare cases, a papilla has been observed to contain both nerves and blood-vessels. This anomaly is supposed to be due to fusion of two distinct papillæ.

The papillæ are most numerous and perfectly developed on the palms, the tips of the fingers, and the soles, where they are arranged in a series of circular or elliptical ridges. Meissner observed four hundred upon a square line of the end of the finger, and Weber found one hundred and fifty to two hundred single, and eighty-one compound papillæ upon a square line of the palm of the hand. They are also present in great numbers upon the nipple, the clitoris, the glans penis, the labia minora, and also on the prolabium. The smallest papillæ are found on the face, especially upon the eyelids, brows, nose, cheeks, and chin. Those on the general surface of the body are also small in size. The total number of the papillæ is very great. Sappey says that there are over sixty thousand to the square inch in many regions of the body. An estimate, based on this statement, would make the number on the whole surface of the body vary between one hundred and fifty and two hundred millions.

STRATUM RETICULARE OR TUNICA PROPRIA.—The reticular layer is the lower portion of the corium. It is composed mainly of bundles of white fibrous tissue, which decussate at first without division. The largest meshes are filled with fatty tissue, and contain blood-vessels, lymphatics, and nerves. They also give passage to the deep-seated hair-follicles and the sudoriparous ducts. The smaller interspaces contain connective-tissue corpuscles and wandering cells. The bundles of connective-tissue cross each other obliquely, divide and subdivide as they proceed upward until they reach the papillary layer, which is formed by the interlacement of numbers of single fibrillæ.

The manner in which these bundles intersect accounts for what has been called the "cleavage" of the skin. Different parts of the skin may be mapped out in tracts in which the connective-tissue bundles exhibit a definite parallel arrangement. This structural peculiarity has much to do with the extensibility of the skin.

**The Subcutaneous Connective Tissue.**—This portion of the integument is composed principally of bundles of fibrous connective tissue, which rise obliquely from the periosteum, or from the superficial fascia, and merge imperceptibly into the substance of the corium. These bundles vary in size, but are cylindrical in form, and interweave with each other, forming a series of networks with well-defined interfascicular spaces. Adipose tissue is found in more or less quantity in these spaces, constituting the *panniculus adiposus,* upon the liberal development of which the plumpness of the body depends. According to Biesiadecki,[1] the individual fat-globules are composed of minute drops of oil, each of which is inclosed in a delicate membrane. They are sometimes round or oval in form, but more frequently polyhedral from pressure. The membrane or cell-wall is so distended by its contents that it is not discernible until they have been extracted by alcohol or ether. The fat-globules are aggregated into masses or lobules of varying size. Each lobule is provided with an afferent artery, a capillary plexus, and one or more efferent veins. Several lobules at times unite to form an acinous-like structure which is surrounded by a sheath of connective tissue. Large quantities of fat are found beneath the skin of the palms and soles, the back, the buttocks, and the mammary glands. Warren[2] has shown that in the thickest portions of the skin, columns or pillars of fat extend from this layer in an oblique direction through the lower two-thirds of the corium, and terminate at the base of the follicles of the lanugo. These columns are almost continuous in direction with the arrector-pili muscles, to which they are also attached. They convey blood-vessels and lymphatics to the corium, and occasionally contain sudoriparous glands. Their function has not been definitely ascertained. Warren believes that they furnish flexibility to the otherwise dense and unyielding integument, and that they assist in the action of the arrector-pili muscles, and are essential to the nutrition of the lanugo. In health they furnish a channel for the blood-vessels and lymphatics, and in disease they provide an outlet for various morbid products.

The quantity of fat in the subcutaneous connective tissue varies greatly. It is usually found in larger proportion in women and children than in men, and lessens with advancing age. In cases of starvation, and in all diseases attended with waste of tissue, the contents of the fat-globules disappear; but the cell-walls remain, and are rapidly refilled when health returns. Obesity consists in an over-production and abnormal deposition of fat. As the result of irritation, or some unknown cause, a circumscribed accumulation of fat may take place under the skin, forming a lipoma or fatty tumor. Some of these growths attain a very large size.

Some portions of the body, as the eyelids, penis, scrotum, and labia minora, are destitute of fat. The interfascicular spaces of the subcutaneous connective tissue in these regions are traversed by fine connective-tissue bands, or single fibrillæ. The interstices between the fibrillæ and the primary bands vary in size under different circumstances, and in proportion to the amount of fluid in the tissues. In some pathological conditions they are almost obliterated, while in others they are greatly increased in size.

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[1] "The Section of the Skin," by Professor Alfred Biesiadecki, in Stricker's Manual of Histology.

[2] See Warren's Monograph on "Fat Columns."

The cells of this layer consist of fixed or true connective-tissue cells, and lymphoid corpuscles or wandering cells which have migrated from the blood-vessels. The former are more or less spindle-shaped, and send processes between the primitive bundles of white fibrous tissue. These processes gradually develop into yellow elastic fibrillæ. The lymphoid corpuscles are most abundant in the vicinity of the blood-vessels and glands, where they are similar in size and appearance to the white corpuscles of the blood. As they wander further into the tissues, they lose their circular form, and become somewhat spindle-shaped also.

The sudoriparous glands and the bases of the deep-seated hair-follicles are imbedded in the subcutaneous connective-tissue; this also contains lymphatics, nerves, and blood-vessels. Some of the nerves terminate in Pacinian corpuscles. The larger lymphatic vessels have a markedly transverse muscular structure, and are surrounded by a minute vascular network. The blood-vessels are of large size, and after supplying the hair-follicles, sudoriparous glands, and fat-globules, send a number of branches to the corium.

**The Sweat Glands.**—The sudoriparous or sweat glands are small, round or oval-shaped bodies, which are imbedded in the subcutaneous connective tissue, and discharge their secretion on the surface of the epidermis by means of the sudoriparous ducts. They are yellowish or yellowish-red in color, and vary in size in different parts of the body. They are smallest on the eyelids, the nose, and the pinna of the ear, where they range from $\frac{1}{200}$ to $\frac{1}{120}$ of an inch in diameter; and largest on the areola of the nipple, the base of the scrotum, and in the axilla, where they sometimes attain a diameter of $\frac{1}{10}$ of an inch. A sudoriparous gland consists essentially of a number of convolutions of a minute tube, which commences with a blind extremity, and is coiled upon itself several times to form a more or less globular mass which is the body of the gland. The tube then ascends in a perpendicular or oblique direction to the free surface of the epidermis, and becomes the duct or excretory canal of the gland. It passes through the lower portion of the corium in a direct or slightly flexuous manner, and, emerging between two papillæ, pursues a more or less tortuous and spiral course through the layers of the epidermis, and finally terminates in a funnel-shaped opening or pore. Where the epidermis is thick, as on the palm of the hand and the sole of the foot, the tortuosity of the ducts is marked, and the pores are large in size.

Kölliker's investigations lead him to believe that the sudoriparous glands first appear in the fifth month of embryonic life as perfectly solid processes of the stratum Malpighii which gradually elongate, and, penetrating the deeper structures, begin to coil upon themselves. They are therefore to be regarded as simple involutions of this layer, which, by a continual process of cell-multiplication, grow deeper and deeper into the corium and subcutaneous connective tissue, become convoluted, and divide into the glands proper and their ducts, while at the same time, either by a process of liquefaction of their central cells or by the excretion of a fluid between the cells, a lumen or cavity is formed. Klein has observed that both the gland and its duct are lined with a delicate cuticle which is especially marked in the duct and in the commencement of the coiled tube. In the epidermis the lumen bordered by this cuticle is all that is present of the sudoriparous duct. Unna insists that the duct ends in reality at the surface of the corium, and that the tortuous canal which appears to be its continuation through the epidermis does not belong to it alone, but is also the receptacle for the exudations from the interstices of the epidermis.

The duct proper has two other coats—the external one, or limiting membrana propria, which is continuous with the basement membrane of the surface of the corium, and the middle or epithelial coat, which is continuous with the deeper layers of the stratum Malpighii, and is composed of two or three rows of nucleated polyhedral cells.

The proximal portion of the coiled tube which forms the body of the gland is identical in size and structure with the sudoriparous duct, with which it is directly continuous. The remaining or distal portion is much larger in diameter, and differs, according to Klein and Kölliker, in these essential respects, that its middle or epithelial lining consists of but one layer of transparent columnar cells, and that there exists between it and the limiting membrana propria a layer of non-striped muscle-cells which are arranged parallel with the long axis of the tube. This distal portion of the tube is of relatively great length in the glands of the palms and soles, the scrotum, the nipple, the scalp, the axilla, and other regions of the body, and its epithelial cells contain a considerable number of granules.

Each sudoriparous gland is surrounded by an investing sheath of connective tissue, interspersed with fat-cells, which supports the vessels that supply the gland, and binds the convolutions of the tubes closely to each other. Connective-tissue fibres with numerous cells accompany the duct, running parallel to it through the corium, and as a rule there are also two accompanying small blood-vessels (Biesiadecki). The nervous supply of the sudoriparous system has not yet been demonstrated. Langerhans, however, claimed, years ago, to have found traces of a nervous structure in the inter-epithelial spaces of the outer coat of the duct.

Sudoriparous glands are found in great numbers in every portion of the body except the glans penis, the clitoris, and the red border of the lips. Their distribution varies widely, however, in different regions of the body. In the axilla they form a continuous layer beneath the corium.

Krause states that there are 2,736 in a square line on the palm of the hand, 2,685 in the same space on the sole of the foot, 1,490 on the back of the hand, 1,258 on the forehead, 1,136 on the chest and abdomen, 1,123 on the inside of the arm, 566 on the inside of the thighs, 548 on the cheeks, and 417 on the neck, back, and buttocks in every square inch. The same observer estimated the total number of these glands on the body of an adult of average size to be 2,381,248. As the length of an untwisted tube is about one-fourth of an inch, the total length of the tubing through which the perspiratory function is carried on is almost fifty thousand feet, or over nine miles.

The secretion of the sudoriparous glands varies in quality and quantity according to their size and situation, and a number of other normal and abnormal circumstances. The small glands secrete a clear, watery fluid without any granular matter. The larger glands, especially those of the axilla, secrete a thicker fluid containing numerous fat-cells, and granules with free nuclei, which are derived from the epithelial cells lining the interior of the gland. This fact led Meissner to believe that the real function of the sweat glands was to furnish a material for the oiling of the skin. This view was not accepted then. Unna has again revived it, and claims that the secretion of the sebaceous glands is only sufficient to lubricate the interior of the hair-follicles, and that the sweat glands exist solely for the purpose of providing an oily material for the surface of the skin. He also believes that the perspiratory fluid, generally supposed to be secreted by the sweat glands, is in reality an exudation from the interstices of the epidermis. Therefore they should be entitled "coil-glands" in future. Further research will, however, probably show that they are necessary for the proper performance of both functions.

Aubert, on the basis of experiments which he has made, maintains that insensible perspiration is due to evaporation from the skin generally, and not to the action of the sudoriparous glands.

The ceruminous glands of the ear are similar in appearance and structure, and allied in function to the glands of the sudoriparous system. They do not exist in the whole external auditory meatus, but only in the cartilaginous portion, between the lining membrane of the ear and the cartilage. They form a continuous yellowish-brown layer, occasionally visible to the naked eye. Their secretion is a modification of that of the sudoriparous glands. The cerumen or wax of the ear is a combination of the secretions of the ceruminous glands with that of sebaceous glands of the auditory meatus. The cerumen is of a dark-brown color generally, becoming very dark when it accumulates and remains as a mass of so-called ear-wax. In the Japanese, the ceruminous glands are smaller, and relatively and actually less numerous, and the secretion in the ear canal, consisting of sebaceous matter slightly colored by cerumen, is almost white.

The circum-anal glands of Gay, which form a zone around the verge of the anus, are to be regarded as a part of the sudoriparous system. They are identical in structure with the coil-glands of the other portions of the body, and differ from them in size only.

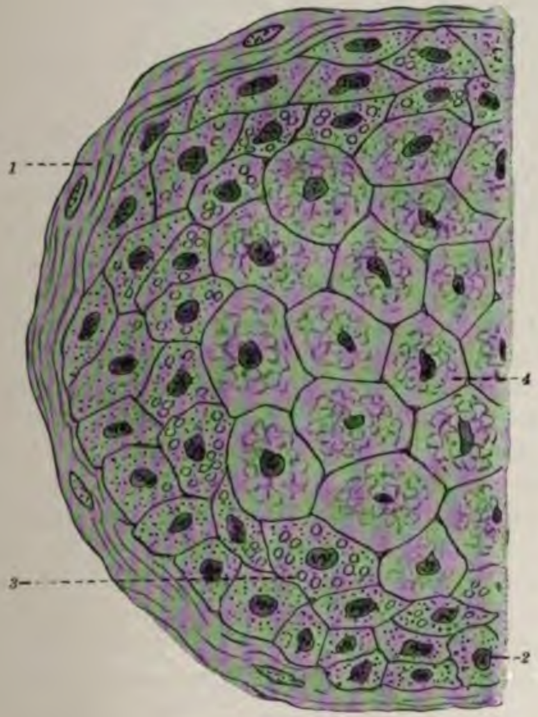
**The Sebaceous Glands.**—The sebaceous or sebiparous glands, called also the glands of the hair-follicles, are simple, or compound, racemose glands, found in every portion of the skin except on the clitoris, the glans penis, the palms, the soles, and the dorsal surfaces of the last phalanges of the fingers and toes. They are invariably situated in the upper or middle part of the corium, and do not extend to the subcutaneous connective tissue. They are most abundant upon the hairy portions of the body, and are connected, as a rule, with the hair-follicles into which their secretion is discharged. According to Sappey, they may be divided into three groups. The first group comprises the glands of the scalp, the beard, the axilla, the pubes, the labia majora, and the scrotum. The hairs in these regions are coarse and fully developed, and each follicle is provided with two, three, or more sebaceous glands, which may properly be regarded as appendages of the hair-follicles.

The glands of the second group are larger in size and more complex in structure, and are connected with the lanugo. The duct of the gland is, however, so much wider than the lanugo-follicle that the relation may be reversed, and the hair considered to be an appendage of the gland. The glands of this group are found mainly upon the forehead, nose, cheeks and areola of the nipples. A few are also present upon the genitalia, and various portions of the chest, the abdomen, and the upper and lower extremities. Piffard says that acne is almost exclusively an affection of this class of glands.

The third group is small in number, and comprises those which open directly upon the surface of the skin, and are not connected in any way with the hair-follicles. They are found only on the internal surface of the prepuce and behind the corona glandis in the male, and upon the surface of the nipple, the vestibule, and the labia minora in the female.

The sebaceous glands are whitish in color, and vary in size in different portions of the skin. The largest are found on the eyelids (Meibomian glands), the mons veneris, the scrotum, the labia majora, in the axillary and anal regions and on the areola of the female nipple (glands of Montgomery), where they frequently attain an enormous size. Those of the scalp are smaller in size, but greater in number. W. Krause has estimated that there are over eighty thousand hair-follicles on the average adult head, each of which is provided with two or more of these glands. Some of the coarse hairs on the genitalia are surrounded by a labyrinth of glands; seven or eight being frequently connected with each hair-follicle. Each gland is composed of from two to twenty acini or lobules, and may be divided into a body or gland proper, and an excretory duct. In structure it consists of an external membrana propria and an internal

## PLATE III



Portion of a Section of an Acinus of a Sebaceous Gland.
(Semi-diagrammatic.) (See page 12)

1. Connective tissue envelope.
2. Cubical cells with imperfectly spheric nuclei.
3. Cells showing granular hyaloplasm and fat
4. Polygonal central cells.

epithelial lining of several layers of nucleated cells, which is practically a continuation of the outer root-sheath of the hair-follicle. The external membrana propria is identical and continuous with the basement membrane of the surface of the corium, and is surrounded by an investment of connective tissue containing blood-vessels, lymphatics, and nerves. The cells of the epithelial lining of the gland proper are almost identical in size and arrangement with those of the stratum Malpighii. Those of the first layer are imbedded in the basement membrane, and are small, granular, and columnar, with spherical or oval nuclei. Next to this, and filling the entire space of the acini, are large polyhedral cells with spherical nuclei, containing a variable amount of fat and fat-globules. The cells nearest the centre of the alveoli are the largest in size, but become shrivelled as they approach the beginning of the duct. The cavity, or centre of the gland, contains a grumous pulp formed of free fat, fat-globules, and epithelial *débris* floating in a watery fluid. This is termed sebum. The duct is similar in structure to the body or gland proper. It is composed of an external basement membrane, an internal epithelial lining, and has a central cavity or lumen through which the sebum is discharged. It opens into the hair-follicle at an acute angle at its upper third; the gland proper lies in the corium nearly on a level with the middle third of the follicle. The ducts of the glands that open directly upon the surface of the skin receive an additional layer of cells from the stratum corneum of the epidermis.

The sebaceous glands begin to be developed at the end of the fourth month of fetal life as small solid projections from the outer root-sheath of the hair-follicles. They gradually attain their definite size and shape by a process of cell multiplication; and an internal cavity or lumen is finally formed by the fatty metamorphosis of the central layer of cells.

**The Hairs.**—Hairs are slender cylindrical structures composed of modified epithelial tissue. They are imbedded in depressions of the skin known as the hair-follicles or sheaths, and are developed from a minute papilla which projects from the base of each follicle. They are found upon every portion of the skin except the upper eyelids, the lips, the palms and soles, the clitoris, the glans penis, and the dorsal surfaces of the last phalanges of the fingers and toes. They vary in length and thickness in different regions of the body, and may be divided into four groups. Those of the first group are long and soft, and are found only on the scalp. Those of the second group are long and coarse, and are found in the beard and whiskers, and in the axillary, perineal, and pubic regions. The third group comprises the short coarse hairs of the eyebrows, eyelashes the nostrils, and the external auditory meatus. The fourth group consists of the delicate lanugo, which are present on the face, trunk, and other portions of the body. The size of the hairs is further influenced by age and sex. They are thicker, in general, in adult age than in childhood, and in the female than in the male.

Their number varies considerably, dependent upon the region of the skin and the individual. According to Whitoff, there are 293 in a quarter of a square inch on the scalp, 39 in the same space on the chin, 34 on the pubes, 23 on the forearm, and 19 in the same space on the front of the thigh. Wilson estimated the total number on the scalp to be 120,000, but Krause and other observers say there are only 80,000. This discrepancy may be due in part to the color of the hair which was the subject of calculation. Light hairs are placed more closely together, and are more abundant, as a rule, than dark ones. They vary in color both in race and individual. The different shades depend upon the amount of pigment material which is present in the cells of the hair, and in the interstitial cement substance which binds them together. In the dark there is an abundance of the interstitial pigment-granules. In the red the pigment material is confined to the substance of the hair-cells. White hairs are destitute of all pigment. Gray contain bubbles of air in their superficial layers. The color of the hair gradually becomes darker from childhood to adult life. It has been estimated that the hair of light-complexioned male children darkens from 55 per cent. during the first five years of life to 33 per cent. at forty-five years. This change is much less marked in females.

The hairs are so elastic that they can be stretched to nearly a third more than their natural length, and if the tension be not too long continued they will contract to very near their normal size. Owing to their fibrous structure they are very strong, and will bear a weight of from one to three pounds without breaking. They absorb moisture readily, and part with it freely. They are therefore either dry and brittle, or moist and soft, in accordance with the amount of fluid secreted by the skin and the amount of moisture present in the atmosphere. They are identical in structure with the horny layer of the epidermis, and like it they contain neither blood-vessels nor nerves. Their nourishment is derived from the cells of the papillæ at the base of the hair-follicles.

Their rate of growth varies from five to seven inches or more in a year. Each hair has a certain limit, after attaining which it remains stationary for a while, and then becomes detached from its papilla and is expelled from the follicle. Those of the scalp, when left uncut, frequently reach a length of six feet in women before this process of degeneration and extrusion occurs.

A complete living hair consists of a free portion or shaft, which extends beyond the surface of the skin; an inclosed portion or root, which is contained within the follicle, and an expanded portion or bulb, which rests upon the hair-papilla at the base of the follicle.

The hair-papilla is a small, pear-shaped or oval body, which arises from the base and projects into the cavity of the hair-follicle. It is about twice as long as it is broad, and is composed of connective-tissue fibres, between which are found numbers of round nuclei and spherical nucleated cells. It is identical in structure with the other papillæ of the corium, and is continuous at its origin with the fibres of the outer layer of the hair-follicle. Its upper surface is covered by a thin basement membrane, which is reflected from the inner layer of the follicle, and which separates it from the hair-bulb. It contains one or two arteries (Biesiadecki), veins and capillary tufts, and some medullated nerve-fibres.

The hair-bulb is the terminal expansion of the root of the hair. It surrounds the papilla, and completely fills the lower part of the follicle. It is composed of several layers of polyhedral, nucleated cells, which resemble the cells of the rete Malpighii. They are united to each other by cement substances, and are continuous with the cells of the outer root-sheath. The layer which is situated on the basement membrane immediately above the papilla is composed entirely of short columnar cells. According to Klein, the cells of this layer are in an active state of multiplication and proliferation, reproducing themselves continually. As this process goes on, the cells of the other layers of the hair-bulbs are gradually forced upward into the cavity of the follicle, where they form the cells of the root of the hair. They also change in shape, becoming flattened and fusiform, constituting the cells of the hair-substance, except in the centre, where they remain polyhedral as those of the medulla of the hair. The peripheral cells which compose the inner root-sheath retain more or less of their original form.

The hair-root proper consists of the medulla, the cortical substance, and the cuticle of the hair. The medulla is composed of several rows of polyhedral cells which occupy the centre of the hair, and extend from the bulb to very nearly the point of the shaft. Kölliker states that they contain neither fat nor pigment granules, but derive their color from the presence of a variable number of minute vesicles which are filled with air. The lanugo and immature hairs have no medullary cells whatever.

The hair-substance, or cortical substance, is composed of several layers of flat, elongated fibres, which form the greater part of the hair and give it shape and consistency; they vary in length and breadth, and are held together by an albuminous cement; they are longitudinally striated, and contain a variable amount of pigment matter. Each fibre consists of two or more flattened epithelial scales, which present a remnant of a nucleus, but are so closely united one to the other that they can only be separated by strong acids or alkalies. Air-bubbles are present in considerable quantity in the spaces between the hair-fibres. The cuticle of the hair is a thin, transparent membrane, which completely invests the hair, and is intimately united with the hair-substance on the inside and the cuticle of the inner root-sheath on the outside. It arises from the neck of the papilla, and extends from the bulb along the entire length of the hair. It is composed of a single layer of non-nucleated hyaline scales, which are frequently round or columnar in the portion surrounding the bulb, but become elongated and fusiform in the root and shaft. They are arranged transversely, and overlap each other like the tiles on a house or the scales on a fish. The cuticle presents more or less marked projections or serrations, according to the degree in which its scales overlap.

The shaft of the hair, or the part projecting beyond the surface of the skin, is identical in structure with the root of the hair.

**The Hair-Follicles.**—The hair-follicles, or hair-sacs, are flask-shaped depressions of the epidermis and corium which closely envelop the roots of the hairs. Each follicle commences on the external surface of the skin by a funnel-shaped opening or mouth, and passes in an oblique or slightly curved direction through the corium into the subcutaneous connective tissue. It terminates in a bulbous expansion which is invaginated over the papilla of the hair. The narrowest portion of the follicle is called its neck, and is situated just below the upper surface of the papillary layer of the corium. The ducts of one or more sebaceous glands empty into the follicle at this point. The follicles of the lanugo do not penetrate as deeply into the subcutaneous connective tissue as do those of the coarser hairs, and frequently do not extend below the deeper portions of the corium. The hair-follicles vary considerably in diameter, and also in number, in the different regions of the body, but agree in their general structure.

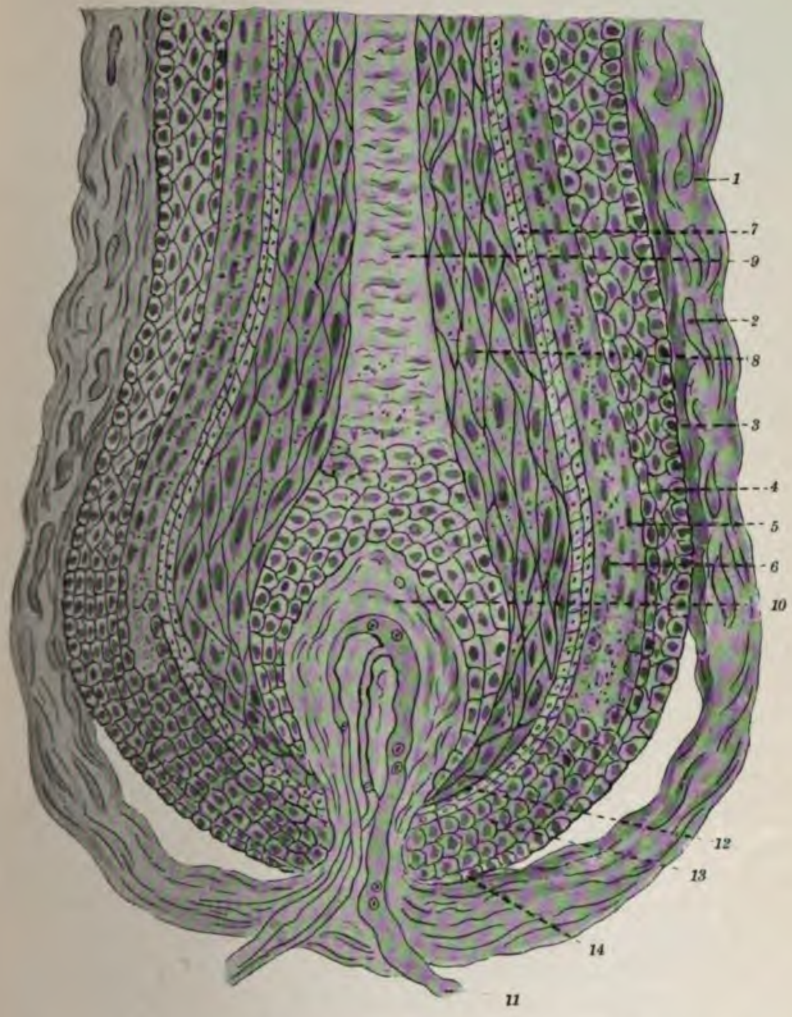
Each follicle consists of an external, fibrous, vascular portion or hair-follicle proper, and an internal epithelial portion, which immediately surrounds the root, and is therefore usually termed the root-sheath.

The external portion, or hair-follicle proper, is composed of an external, a middle, and an internal layer.

The external layer (the external fibrous sheath of Kölliker) is the thickest and most important portion of the follicle. It consists of compact connective-tissue fibres which run parallel with the long axis of the follicle, and which are intimately united with the fibres of the corium above. It merges externally into the surrounding fibrous tissue, and terminates below in an intricate network which envelops the papilla of the hair. It contains a *minute artery* and vein (Biesiadecki) or two, with capillaries, and also nerve-fibres, which divide dichotomously.

The middle layer (the internal fibrous sheath of Kölliker) is composed of a single layer of transversely or circularly arranged spindle-shaped cells with long, narrow nuclei; they resemble, and are generally considered to be, smooth muscle-cells. They line the whole interior of the body of the follicle, but do not extend above its neck. Kölliker says that this layer contains neither blood-vessels nor nerves. The internal layer is also called the hyaline membrane and glassy or vitreous membrane. It consists of a delicate, transparent membrane, which lines the whole interior of the follicle, and is reflected over the surface of the hair-papilla.

PLATE IV



Longitudinal Section of a Hair-bulb and Follicle from a Beard-hair.
(Semi-diagrammatic.) (See page 16)

1, Outer coat of follicle, fibres longitudinally arranged.
2, Middle coat of follicle, fibres transversely arranged.
3, Inner coat of follicle, more condensed.
4, Prickle-cell layer of follicle.
5, Outer layer of root sheath
6, Inner layer of root sheath.
7, Cuticles of root sheath and hair.
8, Cortex; spindle-cells with pigment-granules.
9, Medulla.
10, Papilla.
11, Capillary loop.
12, Matrix of cortex.
13, Matrix of root-sheath.
14, Matrix of prickle-cell layer.

It is a direct continuation of the basement membrane of the corium, and contains neither vessels nor nerves.

The root-sheath, or the internal portion of the hair-follicle, is continuous with the lower stratum of the epidermis, and is made up of an outer and an inner layer. The outer root-sheath is a prolongation of the stratum Malpighii, with which it is identical in structure and arrangement. It is composed of an external layer of columnar cells, next to which are found several rows of polyhedral cells. Its inner wall is formed by one or more rows of flattened, nucleated scales. It extends along the entire inner surface of the follicle, but is thinner at the neck than in the body, and becomes continuous at the base with the cells of the hair-bulb. There are no blood-vessels in the outer root-sheath; but, according to Langerhans, it contains a few nerve-fibres similar to those which are found elsewhere in the stratum Malpighii.

The inner root-sheath is a delicate membrane which is closely connected externally with the outer root-sheath and internally with the cuticle of the hair. It arises from the neck of the papilla at the base of the hair-follicle, and is composed of an outer, or Henle's layer, which is a single layer of elongated cells without nuclei; an inner, or Huxley's layer, consisting of one or two strata of polygonal nucleated cells; and an internal, delicate cuticle. Biesiadecki remarks that the internal root-sheath is developed from the cells of the root of the hair. It terminates at the neck of the follicle, and contains neither blood-vessels nor nerves.

Each hair-follicle is supplied with one or more muscles, the *arrectores pilorum*, which are composed of several bundles of non-striated fibres. They arise by a series of digitations from the upper portion of the corium just beneath the basement membrane, and, passing obliquely downward, encircle the sebaceous gland, and become inserted in the lower portion of the hair-follicle. They are invariably found on the inner side of the follicle, with which they form an acute angle. Their attachment to the hair-follicles is to be regarded as a relatively fixed point, and that to the corium as a relatively movable one. (Tomser.)

When these muscles contract they depress the papillary layer at various points along the periphery, draw the hair-follicle from an oblique into a vertical position, and, by elevating the hair-follicle and hair above the surrounding surface, produce the condition known as *cutis anserina* or "goose-flesh." The hair is at the same time compelled to assume a more upright position, or, as is commonly said, "to stand on end."

They also, by contracting, compress the sebaceous gland, and assist in the discharge of its secretion.

The hairs begin to develop in the third month of fetal life, as small, solid, cylindrical projections from the under surface of the stratum Malpighii, which fit into the depressions in the corium. As multiplication and cell-proliferation continue, they penetrate deeper and deeper into the substance of the corium, which becomes condensed around them, and forms the hair-follicle proper, and at its fundus forms the papilla upon which the Malpighian cells are invaginated. The cells around the papilla proliferate rapidly and create the hair-bulb from which the hair proper and the inner root-sheath are gradually developed. The new hair does not penetrate the stratum corneum of the epidermis at once, but burrows its way into that layer in an oblique direction for some time before reaching the surface. The first hairs are always of the lanugo type.

When a hair has reached its limit of existence it undergoes degeneration, becomes separated from its papilla, which atrophies, and a new papilla and a new hair are formed in connection with the old follicle. According to Klein, the lower part of the follicle including the hair-bulb degenerates also, and is gradually absorbed. There is then left only the upper part of the follicle and the hair-root, the fibres of which become fringed at the distal end and lost among the cells of the outer root-sheath, constituting the hair-knob of Henle. After a time a cylindrical outgrowth of epithelial cells projects downward from the outer root-sheath and becomes invaginated over a new papilla. Multiplication and cell-proliferation ensue, and a new hair-bulb and hair are formed, and the old hair is gradually pushed out of the follicle as the new one makes its way to the surface.

**The Nails.**—The nails are dense, horny, translucent structures which are implanted in the skin of the dorsal surfaces of the terminal phalanges of the fingers and toes. They are roughly quadrilateral in shape, and flattened anteriorly and posteriorly, but curved from side to side. Their anterior border is free; their posterior and lateral borders are inserted in a fold of the skin called the nail-groove. The nail-groove is shallow at its commencement at the tip of the finger, but deepens as it extends posteriorly. That portion of the nail which is inclosed in the groove is called the root of the nail, the remainder constitutes the body of the nail. The nail-bed is that part of the skin upon which the body of the nail is imbedded. It is composed of stratum Malpighii, corium, and subcutaneous cellular tissue. The matrix is the posterior portion of the nail-bed, and is situated immediately beneath the root of the nail. The white line at the base of the nail is called the *lunula*, and represents the anterior termination of the *matrix*. The corium of the nail-bed is firmly united by bands of fibrous tissue to the underlying periosteum. It is richly supplied with blood-vessels and nerves, but contains no fat. The subcutaneous cellular tissue is also destitute of fat.

The nail is composed of a number of layers of flattened homogeneous epithelial scales, some of which contain a remnant of a nucleus. We learn from Klein that it represents the stratum lucidum of exaggerated thickness situated over the stratum Malpighii of the nail-bed. The nail-cells are developed from the matrix, and are gradually pressed forward over the nail-bed.

The nails grow more rapidly in summer than in winter, and in childhood than in old age. They grow continually if cut, but when left uncut they only attain a certain length, after which their development ceases. They begin to form in the third month of fetal life, and are fully developed by the end of the eighth month. The authority just quoted says they are produced by a rapid multiplication of the cells of the stratum Malpighii, and the conversion of its superficial cells into the scales of the stratum lucidum. The nail is covered by the stratum corneum at this stage, but at the end of the fifth month its margins break through, and by the end of the seventh the greater part has become clear. During attacks of severe illness, the growth of the nails is checked for a time, and subsequently a transverse line, or ridge, may be developed on the nail. Relapses may also cause secondary ridges to form. As pointed out by DaCosta, this might have some diagnostic importance.

**Muscles of the Skin.**—The skin contains both striated and non-striated muscular fibres. The former are found only in the forehead, nose, cheeks, and neck, where they arise from the subcutaneous cellular tissue, or from the fascia of the superficial layer of muscles, and passing obliquely upward are inserted into the corium between the hair-follicles and the sebaceous glands. The non-striated muscles are more numerous, and are present in every portion of the skin either as compound fibres which run horizontally to the surface and form anastomosing networks, or as bundles of fasciculi which run obliquely upward. According to Unna, they may be divided into muscular membranes, the arrectores pilorum, and the proper diagonal muscles of the corium. The muscular membranes are found in the skin of the scrotum, the penis, the mammary areola, and the nipple. They are composed of a network of bundles of muscular fibres, which are deposited in layers in the corium, and run parallel to its surface. They are especially well developed in the areola of the female nipple, where they are arranged in a delicate circular layer which becomes thicker as it approaches the base of the nipple. Kölliker states that this layer is occasionally visible to the naked eye. The muscular fibres of the nipple run in various directions, and form an exceedingly close network which surrounds the lacteal ducts, and constitutes their sphincter.

The arrectores pilorum are the muscles of the hair-follicles.

The proper diagonal muscles of the corium (Unna) are similar in structure and size to the arrectores pilorum, but have no connection with the hair-follicles. They arise from the upper portion of the papillary layer of the corium, and running obliquely downward are inserted into its lower portion, or into the reticular layer. When they contract they produce a general condensation of the tissues of the corium. As a result of this action, the blood-vessels are subjected to increased pressure, the blood is driven from the periphery toward the centre, and the papillary layer becomes pale and bloodless. At the same time the sebaceous and sudoriparous glands are compressed, and their contents forced outward along their ducts. The cold sweat of fear is thus produced.

The number of muscular fibres varies in different portions of the skin. They are most abundant in the scrotum, where they form a continuous layer, known as the dartos layer. They are also present in great numbers in the prepuce and the skin of the penis. Neumann observes that they are less developed on the flexor than on the extensor surfaces, and occur with diminishing frequency on the perineum, scalp, forearm, thighs, shoulders, forehead, abdomen, axilla, legs, face, the palmar and plantar and dorsal surfaces of the hands and feet.

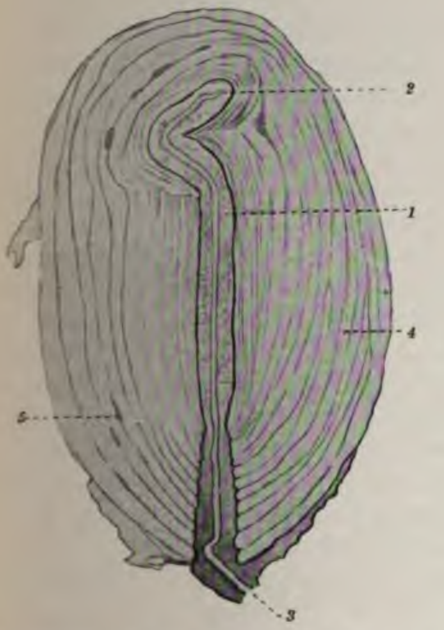
**The Blood-Vessels of the Skin.**—There are no blood-vessels in the epidermis, but the corium and subcutaneous connective tissue are abundantly supplied with arteries, capillaries, and veins. The arteries of the subcutaneous connective tissue are of large size and anastomose freely, forming a plexus from which small branches pass off in all directions to the fat-lobules, sweat glands, hair-follicles, and muscles of the skin. Other and larger branches proceed directly or obliquely upward to the superficial layers of the corium, and, after sending small branches to the sebaceous glands and the upper part of the hair-follicles, form a second plexus, which is situated directly beneath the base of the papillæ. Millions of minute capillaries arise from this superficial plexus and project into the substance of the vascular papillæ. Each papilla is supplied with a single arterial capillary, which, after pursuing a tortuous course toward the apex, bends over and passes down and out as a venous capillary. These venous capillaries unite in the upper layer of the corium to form a network of minute veins, from which larger ones arise, and passing downward empty into those of the subcutaneous connective tissue.

There are no capillaries, as a rule, in the papillæ which contain nerve-fibres, or tactile corpuscles.

All the arteries and veins in the upper portion of the corium consist only of a single layer of endothelial cells, which is re-enforced as they approach the subcutaneous connective tissue by a rudimentary media and adventitia (Unna). Hoyer says that many of the cutaneous arteries in the nail-bed and in the skin of the terminal phalanges of the fingers and toes empty directly into the veins of those parts without the intervention of capillaries.

The subcutaneous arteries in certain places send branches through the subdermal layer to the deeper portion of the corium, where they form the anastomosis, the *rete arteriosum cutaneum.* More superficial than this is the subpapillary plexus (or *rete arteriosum subpapillare*) parallel to the free surface of the skin, and beneath the bases of the papillæ. The latter are supplied by the terminal twigs, which ascend vertically from the subpapillary network and break up into capillary loops that occupy the papillæ and lie close beneath the epidermis. With the exception of the

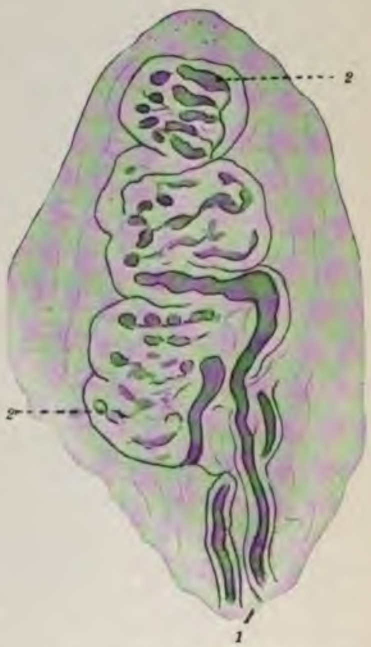
## PLATE V



Longitudinal Section of a Pacinian Corpuscle of Man.
(*After Kollicker.*)

(See page 21)

1. Indefinite granular core.
2. Termination of axis-cylinder of nerve.
3. Nerve entering the corpuscle, forming the "stalk."
4. Cortex made up of laminated capsules.
5. Nuclei in transverse section.



Tactile Corpuscle within a Papilla of the Skin of the Hand.
(Stained with Chloride of Gold—*after Ranvier.*)

(See page 23)

1. Two nerve fibres entering the corpuscles.
2. Terminal ramifications of the axis-cylinder within the corpuscle.

loops entering the papillæ, the capillaries enclosing the hair-follicles arise from the subpapillary plexus (Piersoll).

The fat-lobules, the sebaceous and sudoriparous glands, the hair-follicles, and the cutaneous muscles, are surrounded by a dense network of capillary vessels which terminate in one or more efferent veins. The larger arteries are richly supplied with nerve-fibres.

**The Lymphatics of the Skin.**—The lymphatic system of the skin is composed of lymphatic vessels proper and lymph-spaces. The former are well-defined circular canals inclosed by their own distinct walls; the latter are interstices in the substance of the skin between the capillaries and lymphatic vessels, and contain a variable amount of fluid. They have no distinct wall, and freely communicate with each other. They are the principal seat of the effusion in all exudative diseases.

Lymphatic vessels are found in every portion of the skin, but they are most abundant in those regions where its attachment to the subjacent tissues is comparatively loose, as on the eyelids and scrotum. They present a distinct lumen, which is bounded by a single layer of elongated, flattened endothelial cells. Those of the subcutaneous cellular tissue have a rudimentary muscular coat in addition, and contain one or more valves. They are arranged in a series of plexuses, which ramify horizontally in the corium and subcutaneous connective tissue. Those of the superficial layer begin with a blind extremity in the upper portion of the papillæ, and unite to form an exceedingly close network of minute vessels, which become larger in calibre as they descend in the substance of the corium. They finally empty by a few large trunks along with those of the deeper layers into the lymphatics of the subcutaneous cellular tissue.

The lymph-spaces of the corium and subcutaneous tissue are identical with the interfascicular spaces, and communicate with the lymphatic vessels of those parts by means of a multitude of small stomata. There are none of these vessels in the stratum Malpighii. The circulation there is carried on entirely through the lymph-spaces, which are the interstices between the so-called prickle-cells. The fat tissue, the sudoriparous and sebaceous glands, and the hair-follicles are supplied with separate lymphatic vessels, and honeycombed with lymphatic clefts and sinuses.

**The Nerves of the Skin.**—The stratum Malpighii, the corium, and the subcutaneous connective tissue are richly supplied with nerves, but none have yet been discovered in the stratum corneum. The nerves of the subcutaneous connective tissue are large in size, and are directly continuous with the large nerve-trunks of the subjacent structures. They send horizontal branches to the large arteries and Pacinian corpuscles, and then pass obliquely upward to the under surface of the corium, where they divide into a number of minute branches which ramify through the substance of the corium, and are composed of both medullated and non-medullated fibres. The medullated terminate in the Pacinian and tactile corpuscles, and are consequently most numerous in the regions where those structures are most abundantly developed. The non-medullated are present in every portion of the skin.

Sensory nerve-endings may be divided into free and encapsulated.

FREE SENSORY NERVE-ENDINGS.—Free sensory nerve-endings are found in the deepest layer of the epidermis, where the very fine nerve fibrillæ ramify between the cells of the germinative layer, and terminate in minute free "end-knobs." Similar free nerve-endings are found in the connective-tissue layer of the skin, and tunica propria of mucous membranes. Within the integument end ramifications of sensory neurones surround the hair-follicles, lying upon the outer surface of the glassy membrane.

The *tactile cells of Merkel* are found in the deeper layers of the epidermis. They represent a transition form between the free end knobs and the more specialized end-organs. In these the termination is in the form of a cup-shaped expansion, or meniscus, in which rests the modified epithelial cells.

ENCAPSULATED NERVE-ENDINGS.—These are generally described as corpuscles:

**The Pacinian Corpuscles.**—The Pacinian corpuscles, or corpuscles of Vater, are small, firm, compact, semi-transparent bodies, from .05 to .15 mm. in length and .01 to .05 mm. in breadth, which are found in large numbers in the subcutaneous connective tissue of the corpora cavernosa, the palms of the hand, and the soles of the feet. They are especially abundant and well developed on the inner surfaces of the terminal phalanges of the fingers and toes. Their total number on each hand and foot varies from 600 to 1,400. They are more or less elliptical or ovoid in form, and are plainly visible to the naked eye. They are composed of from twenty to sixty lamellæ, or capsules, which are arranged concentrically around a cylindrical or elongated central cavity. The capsules consist of an internal layer of nucleated endothelial cells and an external layer of hyaline ground-substance, in which fine bundles of connective-tissue fibres are imbedded.

Each Pacinian corpuscle is pierced at its base by a single medullated nerve-fibre, which gradully loses its neurilemma as it passes through the capsular layers, and enters the central cavity as a simple axis-cylinder, which finally divides into two or more branches, terminating in pear-shaped enlargements in the distal portion of the central cavity. This cavity is lined by a granular albuminous substance containing traces of cell-structure, which has been supposed to be identical with the medullary substance of the nerve. The lamellæ are developed from, and are directly continuous with, the external layers of the neurilemma. According to Biesiadecki, a large artery enters the corpuscle near its base, and forms a network of capillaries that ramify between its outer lamellæ.

The axis of the Pacinian body, therefore, is occupied by a core or inner bulb of semi-fluid substance, in which the naked axis-cylinder is imbedded.

**The Golgi Mazzoni Corpuscles.**—The Golgi Mazzoni corpuscles, found in the subcutaneous tissue of the pulp of the fingers, are modifications of the Pacinian end-organs, but differ in possessing fewer lamellæ, a relatively larger core, and a more branched axis-cylinder.

**The Tactile Corpuscles.**—The tactile corpuscles, called also touch-corpuscles, corpuscles of Meissner, and corpuscles of Wagner, are small round or oval bodies, which are present in the sensory papillæ of the corium. They vary in number in different regions of the body. Meissner has estimated that there are one hundred and eight in a square line on the flexor surfaces of the terminal phalanges of the fingers, but only forty in the same space on the second, fifteen on the first, and eight in the palm of the hand. They exist in considerable numbers on the lips and nipples, and are more or less scattered in other portions of the body. They occupy the greater portion of the papillæ in which they are found, and present a transversely striated appearance on section. They are composed of large, flat connective-tissue cells, which are held closely together by a network of delicate fibres, and are surrounded by an investment of fibrous tissue. Each corpuscle is penetrated by a single medullated nerve. Klein states that the nerve first pursues a winding course around the corpuscle, during which its neurilemma becomes fused with the fibrous sheath of the corpuscles. It then loses its medullary substance, and penetrates into the interior of the corpuscle as a simple axis-cylinder. This axis-cylinder further divides into a number of minute branches, which ascend spirally through the substance of the corpuscle and terminate in small pear-shaped or cylindrical enlargements, known as the touch-cells of Merkel.

The genital corpuscles of Krause, and the end-bulbs of Krause, are irregularly spherical or ellipsoidal bodies, generally resembling in structural plan the tactile corpuscles, and are found immediately beneath the epithelium of the penis, clitoris, and vagina.

**The End-Bulbs of Krause.**—The end-bulbs of Krause also lie within the corium. They are found in the edges of the eyelids, the conjunctiva, and corneal margin, and also in the lips and around the mouth, and in the external genital organs. They are found, therefore, in portions of the skin which are most endowed with sensibility. The end-organs of Ruffini, similar to the preceding, lie in the deeper layer of the corium often associated with Pacinian bodies.

NON-MEDULLATED NERVES.—The non-medullated nerves give off branches in the lower portion of the corium to the blood-vessels, the hair-follicles, and the sebaceous and sudoriparous glands. They then ascend obliquely to the superficial layer of the corium, where they form a dense plexus around the papillary vessels. From this plexus numerous elementary fibrils ramify in various directions. Some pass downward into the tissues of the corium, but the greater number pierce the basement-membrane, and, passing through the stratum Malpighii, form another plexus there, from which other fibrils pass upward into the stratum granulosum. It was formerly believed that they ended in this layer as minute expansions between the granular cells; Unna, however, states as a result of the most recent investigations that they penetrate the protoplasm of the cells and terminate in a minute bulb, which is closely applied to the nucleus of the cells. They sometimes wind around the nucleus, but do not penetrate it. The latest investigations show that the fibrillæ always occupy the intracellular channels, and are never directly connected with the substance of the epithelial elements. (Piersoll.)

## PHYSIOLOGY OF THE SKIN.

The skin has more numerous and varied functions than any other organ. It forms a protective covering for underlying structures, prevents too rapid evaporation of the water of the tissues, and assists in maintaining the body temperature at the normal standard. It is of the utmost importance as an organ of sensation, secretion, excretion, and absorption. It also serves as an accessory organ of respiration.

The cushion-like formation of the subcutaneous connective tissue, and the elasticity and firmness of the corium, modify the effect of external injuries, and protect the internal organs to a more or less extent from shock. The comparative impermeability of the horny layer of the epidermis prevents too rapid transudation and evaporation of the fluids. If it were not for the barrier thus interposed, the escape and evaporation of the water would be so continuous and excessive that the tissues would become dried up and death ensue. The horny layer is also a protection to a considerable extent against the action of caustic or irritant substances, and the effects of high or low temperature. The hair of the head and face is an additional protection against injuries, as well as against excessive heat and cold. The mustache and beard debar foreign matter from entering the air-passages, the eyebrows prevent the perspiration from running over the eyelids, the eyelashes prevent particles of irritants from settling on the conjunctiva, and the short, stiff hairs at the openings of the ears and nostrils obstruct the entrance of insects into those passages.

Professor Exner points out that upon folds of the skin which come in contact, as in the axilla, and between the scrotum, or labia majora, and the thigh, the hairs serve as rollers, and facilitate the gliding upon each other of opposed surfaces.

**Regulation of the Temperature of the Body.**—One of the most important functions of the skin is that of maintaining the temperature of the body at the normal standard, about 98.4° F. An increase of ten degrees above, or a decrease of fifteen degrees below, that standard, is incompatible with life. Owing, however, to the power which the skin possesses of resisting or accommodating itself to changes in the external temperature, much greater variations are every day endured with impunity.

The skin and its appendages are imperfect conductors of heat. They protect the body against the effects of cold by retaining within the tissues a considerable proportion of the heat which is produced there. This action is further assisted by the reflex irritation of the surface when exposed to cold, which causes involuntary contraction of the cutaneous muscles, by which the blood is driven from the peripheral vessels towards the centre, the general cutaneous surface lessened in extent, and the radiation of heat proportionately diminished.

They also form a mechanical protection against the action of moderate external heat. The processes by which the human body is enabled to resist a continuously high temperature are more intricate. The problem in this case is to prevent the temperature of the body from rising above the normal at a time when it is not only producing a superabundance of heat within itself, but is also surrounded by a still hotter atmosphere from which it is constantly receiving accessions. The chief means by which this result is attained is by a large increase of the cutaneous transpiration. In consequence of the impression made by a warm or hot atmosphere on the vaso-motor nerves of the skin, the cutaneous muscles become relaxed, the blood-vessels dilated, and the general vascularity of the skin increased. A much greater surface is thus exposed for radiation and transudation, the skin becomes bathed with perspiration, by the evaporation of which active heat is converted into latent heat, and the temperature of the evaporating surface correspondingly diminished. This effect in reducing the temperature of the body or preventing an abnormal rise is greatest when the air is dry as well as warm. The amount of perspiration secreted under these circumstances is sometimes very great, amounting to from one to four pounds in an hour. The degree of heat that can be endured as long as perspiration and evaporation are not interfered with is astonishing. Drs. Blagden and Banks ascertained that a temperature of 211° could be borne without much inconvenience for a limited time in dry air. During one of their experiments the temperature was raised to 260°, and kept at that point for eight minutes. At the end of that time the clothes and furniture in the room were very hot, but the temperature of the body remained about normal. Tillet mentions the case of a girl who remained in an oven for several minutes without any ill effect while the temperature was 324.5°. The workmen of Sir F. Chantrey became habituated to entering the oven where their moulds were dried while the thermometer stood at 350°, and those employed by M. Magnus were accustomed to entering his oven when the temperature was over 400°. Chabert, the fire-king, is said to have entered ovens which were heated to 400° and 600°. In all these cases the atmosphere was perfectly dry, and the bodily temperature was kept down by the production and evaporation of a profuse amount of perspiration.

When, however, the air is moist, as well as hot, evaporation is effected with more difficulty; the temperature of the body rises rapidly, and the degree of heat that can be endured is much less. C. James, an English observer, was overcome by a temperature of 112° in the vapor-baths of Nero; but in the caves of Testaccio, in which the air is dry, he suffered very little inconvenience, although the temperature was 176°. In the former evaporation from the skin was an impossibility, while in the latter it was abundant. Being exposed to so many vicissitudes, it is not surprising that the temperature of the skin itself should be neither as elevated nor as constant as that of the interior of the body. Differences are observable, also, in different regions of the integument. It is evident to the touch, for instance, that the habitual temperature of the forehead is greater than that of the feet. A series of interesting experiments upon the subject of local temperatures has been conducted by A. J. Kunkel.[1] This investigator finds, notwithstanding considerable fluctuations due to various causes, that the skin tends to approximate a constant degree, which he terms the optimum, and that a marked deviation from this optimum is productive of pain. In a well-clad individual, sitting in a room of ordinary temperature, the optimum varied from 33.8° to 34.8° C. (92.8° to 94.6° F.). The normal temperature of the parts of the body habitually covered by clothing averages from 34.2° to 34.6° C. (93.5° to 94.5° F.). Local variations, however, result from anatomical and physiological causes. The heat of the skin is increased by activity of tissue-change in underlying parts or organs. In regions situated near the axis of the body, over bulky muscular masses, and over the cranium, maximum temperatures are obtained. High temperatures are observed over great vessels. The face is generally half a degree warmer than the covered parts of the body. When prolonged exposure to cold has depressed the temperature of a large area to 32° C. (89.6° F.) or lower, discomfort is produced. Kunkel states, however, that under highly unfavorable circumstances the surface temperature of the person experimented upon never sank below 31.6° C. (88.9° F.). Upon the face the temperature seldom fell below 26.27° C. (79.4° F.). This temperature, though unpleasant, was not actually painful. When the temperature of the hands was reduced to 25° C. (77° F.), a sensation of pain was experienced. After remaining in a very hot room, the highest temperature (35.5° C. = 95.9° F.) was always found in the face. A sensation of disagreeable heat was present, but no visible perspiration.

The result of these inquiries is to show that, in spite of the frequent and extreme fluctuations to which it is exposed, the temperature of the human skin is nearly constant. Local refrigeration is soon counterbalanced by increased local circulation.

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[1] Monatschefte für praktische Dermatologie.

**The color of the skin**, as pointed out by Major Woodruff,[1] surgeon United States army, has an important function in protecting the deeper tissues from the actinic rays of excessive light. It is the absence of a sufficient amount of pigment in the skin of the white races that makes it impossible for them to permanently settle in the tropics.

**The Respiratory Function of the Skin.**—The respiratory function of the skin is analogous to that of the lungs. Oxygen is absorbed, and carbonic acid is exhaled. The quantity of either which passes through the skin is only a fractional part, however, of that which is taken up or given off by the lungs. Gerlach states that the lungs absorb one hundred and thirty-seven times as much oxygen as the skin. Scharling endeavored to make an estimate of the extent of the cutaneous respiration as compared with the pulmonary by a calculation based on the quantity of carbonic acid given off through each during the twenty-four hours. From his observations, he estimates that the skin performs from one-fiftieth to one-fortieth of the entire respiratory process. It is probable, however, that this result is too high. A great deal of the carbonic acid which is given off is eliminated through its function as a medium of excretion, and is not connected with the process of respiration. When the skin is active and perspiring freely, especially during physical exercise, it is probable that the quantity eliminated is much greater than under ordinary circumstances at rest.

**Sensation.**—The skin is the organ of the sense of touch, by means of which external impressions are recognized and localized. Tactile sensibility is an exaltation of the sensory power, by means of which the shape, size, and other properties of various objects are recognized. The sense of temperature is a variety of common sensation which enables us to differentiate between heat and cold. According to Schiff and Brown-Séquard, each of these impressions is transmitted to the brain by a different set of nerve-fibres.

All parts of the skin are endowed with common sensation, but some regions are more sensitive than others. In those regions of the body where the epidermis is thin, as on the face, neck, breasts, and inner surfaces of the arms and thighs, the susceptibility to external impressions is marked. Where the epidermis is thick, as on the heel, the back, and the outer surfaces of the limbs, the sensitiveness is much less. If the epidermis be removed, and the corium exposed, the sensation of contact is transformed into pain.

The tactile sensibility of the skin varies in accordance with the number of the nervous papillæ in the corium, and the presence or absence of the free nerve-endings and the tactile and Pacinian corpuscles. Impressions made upon the epidermis are transmitted to the papillæ, and through them to the peripheral nerve-endings. The tactile and Pacinian corpuscles probably act mechanically by furnishing a support for the terminal expansions of the tactile nerves, and by presenting a hard surface against which the delicate nerve-filaments can be pressed. They are not essential to the exercise of common sensation, but wherever they exist the power of appreciating delicate impressions is much increased. Meissner remarks that the tactile corpuscles are most abundant on the tips of the fingers, where he counted one hundred and eight in the space of a fiftieth of an inch. Consequently tactile sensibility is most highly developed there, the delicacy of touch of the fingers being proverbial. It can be further increased by education and practice, and by its acuteness frequently compensates in a great degree for the loss of other powers. In this manner the blind become able to read sentences in raised letters, to recognize individuals by the contour of their faces, and even to distinguish various shades of color through some indescribable difference of sensation.

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[1] "Effects of Light upon White Races."

The relative tactile sensibility of different parts of the skin has been ascertained by an ingenious method devised by E. Weber in 1829. This method is based upon the power of recognizing and isolating two distinct impressions made upon the surface at the same time, and at a minimum distance apart. It consists in the application to the skin of two fine points placed at a known distance apart. If two impressions are felt, the distance between the points is to be gradually decreased until the limit of their perception as two points is reached. This is termed the limit of confusion. If the points be brought still nearer together, their double effect will be felt as only one impression. This is conveniently done by an instrument resembling a large pair of compasses, called an æsthesiometer.

We learn from the experiments made by Weber, and confirmed since by other observers, that tactile sensibility is most acute on the end of the third finger and the tip of the tongue. If the eyes be closed, and the points of an æsthesiometer be applied to either the tip of the tongue or the end of the third finger, a double impression is distinctly perceived when the points are only one twenty-fourth of an inch apart; while, for the recognition of two impressions on the palmar surface of the thumb, the points must be separated one-twelfth of an inch; on the red surface of the lip, one-sixth of an inch; tip of the nose, one-fourth of an inch; middle of the dorsal surface of the tongue, one-third of an inch; the eyelids and palm of the hand, five-twelfths of an inch; back of the fingers, seven-twelfths of an inch; forehead and cheeks, five-sixths of an inch; back of the hand, one and one-sixth of an inch; crown of the head, one and one-fourth of an inch; patella and lower portion of the thigh, one and one-third of an inch; leg and dorsum of foot, one and a half inch; back of neck, two inches; sacral region, one and a half inch; sternal region, one and two-thirds of an inch; lumbar and upper dorsal vertebral region, two inches;

and, finally, over the middle cervical and middle dorsal vertebræ, and middle of the thigh and forearm, the points are not perceived as two until they are separated two and a half inches. It will thus be seen that this faculty is sixty times greater in some regions of the skin than it is in others. This difference depends upon the number of primitive nerve-fibres present, and therefore indirectly upon the number of papillæ in the part. If the primitive nerve-fibres are few in number, it is possible that several contiguous impressions may be conveyed to the same nerve-fibre, and consequently produce but one impression on the sensorium. Each nerve-fibre ends in a tuft of delicate filaments which supply an oval or circular area of the skin of about one-four-hundredth of an inch in diameter, but the filaments of contiguous fibres interlace with each other, so that, the more numerous and closer the nerve-fibres, the greater the probability that two simultaneous impressions made upon the surface will be transmitted to different nerve-filaments, and recognized by the sensorium as separate impressions.

The sensibility of the skin to changes in temperature varies in different individuals and in different parts of the body. It is most acute in those portions of the surface where the epidermis is thin. Variations of even one-half a degree can be distinguished with the tip of the tongue. The face and the fingers and the elbow are also capable of appreciating very slight changes in temperature. Leegaard has devised an instrument by which he has been able to study the sensibility of the skin to variations of temperature. He found that in healthy persons three-fourths of a degree either below or above 82° F. was the range of indifferent temperature—that is, which might be pronounced either hot or cold by healthy people, the eyes being closed during application of the test. He made many observations on different portions of the body, and determined that from one to one degree and a half is the smallest measure of difference which could be detected by the skin in health. As a result of his experiments, he believes that the temperature sense is very equally distributed over different parts of the body, the variation in this respect being much less than had been taught by Nothnagel. He found a great difference in individuals as regards their ability to distinguish variations of temperature.

Weber's experiments have shown that sensations of heat and cold are modified by the extent of the surface exposed to the impression; the greater the extent of surface exposed, the more intense will be the sensation produced. The whole hand dipped in water of a certain temperature may feel it too hot to be borne, while to a single finger it may be only comfortably warm.

The sense of temperature is distinct from that of touch, and may remain unimpaired when all other sensation is lost. It is well known that paralyzed limbs, which are insensible to pressure and the contact of the æsthesiometer, are capable of recognizing the difference between heat and cold. This may be explained by the existence of a special set of nerves for the reception and conveyance of thermal impressions, or the occurrence of degenerative changes in the cord or in the cerebrum.

**Absorption.**—It was formally supposed that the horny layer of the epidermis presented an insuperable obstacle to the passage of any substance through the skin into the blood. So much evidence, however, has been accumulated to the contrary, that the importance of the skin as an organ of absorption is now universally recognized. Under ordinary circumstances this function is limited to the absorption of oxygen and watery vapor, but it may be utilized for the administration of various medicinal preparations. Experience has shown that their action when introduced into the system in this manner is almost as prompt and efficacious as when they are taken into the alimentary canal.

The absorption of oxygen by the skin is undoubted, and constitutes an essential part of the general respiratory process. The absorption of watery vapor is well shown by the rapid recovery of the weight which has been lost by excessive perspiration. Persons after taking a hot bath, during which they lose one or two pounds in weight, almost invariably regain their former weight in a couple of hours, although they neither eat nor drink in the mean time. Part of this increase is effected by pulmonary absorption, but a considerable part of it is due to cutaneous absorption. It has also been observed that the sensation of thirst is diminished in a moist atmosphere, and that it may be further lessened by immersing the clothes or the whole body in water. Shipwrecked sailors have relieved their thirst in this way and preserved their lives, long after their supply of drinking-water became exhausted. This happy result is in part due to a diminution of the evaporation of the fluids of the tissues, but is also due in part to the direct absorption of a large quantity of water. In reference to this point, Captain Kennedy says, in the narrative of his shipwreck, which he addressed to the Royal Philosophical Society: "I cannot conclude without making mention of the great advantage I derived from soaking my clothes twice a day in sea-water, and putting them on without wringing. . . . There is one very remarkable circumstance, and worthy of notice, which was that we daily made the same quantity of urine as if we had drunk moderately of any liquid, which must be owing to a body of water absorbed through the pores of the skin. . . . So very great advantage did we derive from this practice that the violent drought went off, the parched tongue was cured in a few minutes after bathing and washing our clothes; at the same time we found ourselves as much refreshed as if we had received some actual nourishment."

Experimental observations have shown that when the temperature of a bath is higher than that of the body, more water is lost by perspiration and pulmonary exhalation, than is absorbed, and there is consequently a loss in weight. In a bath of 90° the processes of exhalation and absorption are equal, but in tepid and cold bathing the gain by absorption exceeds the loss by exhalation, and the body-weight is slightly increased. Various medicinal substances may be introduced into the system through the medium of the bath, and can be afterward detected in the urine. The benefit derived from a residence at the different springs of Europe or America perhaps may be due, in no inconsiderable degree, to the absorption through the skin of the sulphur, the alkaline, or the chalybeate ingredients, of the water in which the daily bath is taken.

The rate of cutaneous absorption depends upon the solubility and diffusibility of the substance which may be placed in contact with the skin, and the degree of atmospheric, or direct pressure. Insoluble substances cannot be absorbed at all, while oxygen, hydrogen, chlorine, and other gases, and chloroform, turpentine, ether, and similar volatile substances, diffuse into the blood with great rapidity. Alcoholic solutions are not well absorbed, but chloroformic solutions of the various alkaloids, when applied to the surface, produce their characteristic systemic effects in a very short time. Prof. N. A. Khrjonshtchevsky, of Kiev, has investigated this subject anew in a series of experiments upon dogs, cats, and boys. The subjects were immersed in a specially constructed bath. Dogs and cats were killed, through the cutaneous absorption, by aqueous solutions of strychnine in two and a half or three hours; by alcoholic ones in one or one and a half; by nicotine solutions in two and a half; by conium in one or one and a half; by veratrine in nine or ten hours; by cyanide of potassium at 25° C. (77° F.) in one or one and a quarter hour; at 42° C. (107.6° F.) in thirteen to fifteen minutes. Indigo-carmine could be detected in an animal's urine in three hours. When a solution of ferrocyanide of potassium was injected into an animal's veins and the animal placed in a bath of lactate of iron (or *vice versa*), there could be seen in about two or two and a half hours a blue discoloration of its cutaneous blood-vessels from the formation of ferrocyanide of iron. Professor Baelz, of Tokio, Japan, has made many experiments in order to determine whether watery solutions of salts are absorbed by the skin. He found that salicylic acid solution 1:1,000 is readily absorbed in baths of 40° to 45° C. (104° to 113° F.), but that salicylate of sodium is not absorbed. Baelz concludes that there is no general law governing absorption or non-absorption through the skin, but that in this respect every substance must be individually tried.[1]

The absorption of soluble but non-volatile substances is effected more slowly, but may be facilitated by friction, by which their particles are forced into the orifices of the glands, where they are dissolved by the secretions and carried into the system through the interstices of the stratum lucidum. It is in this manner that mercurial ointments produce their special effect in syphilis. The poisonous effects of lead and arsenic are developed in the same way in those whose occupations compel them to handle these minerals, or who use them for any length of time as cosmetics.

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[1] "Satellite," September, 1889.

The various oils and fats, and substances dissolved or held in suspension by them, are readily absorbed by the skin. Baths or inunctions of codliver-oil form an invaluable resource in the treatment of phthisis, marasmus, and other wasting diseases. Absorption is increased by massage, or by friction of the skin. Medicated oils or fats (ointments) are thus applied.

By a process known as ionization, or electric-cataphoresis, various medical agents have been introduced into the deeper layers of the skin, and into the absorbents and blood-vessels for therapeutic purposes. Local anesthesia may be produced by introducing cocaine in this way, and mercury, iodine, and other agents susceptible of ionization, have been thus administered.[1]

Medicinal substances applied to the surface of the corium after the epidermis has been removed are absorbed with great rapidity.

**Secretion and Excretion.**—The importance of the skin as an organ of secretion and excretion cannot be overestimated. Any disturbance of its functions in this respect is liable to be followed by the most serious consequences, and their complete suspension is certain to result in death. Instances of recovery after the urinary secretion has been suppressed for several days are recorded, but if the elimination of effete material by the skin be completely arrested, a fatal result will ensue in a few hours. Burns involving more than one-third of the general surface are invariably fatal, not because of the pain or the shock to the nervous system, but because the excretory surface of the skin is lessened one-third. As a consequence of this sudden diminution of the eliminating process, death frequently occurs from cerebral effusion or shock in an hour or two after the injury. In the majority of cases, however, the kidneys and lungs endeavor to compensate by increased work for the lessened excretion by the skin, but the over-excitation of these organs generally results in inflammation in a few days, and the patient dies from pneumonia or nephritis.

The skin secretes sebaceous matter and the perspiration or sweat; it excretes carbon dioxide and water, and, probably, certain other volatile principles which have thus far escaped observation. The elimination of carbon dioxide by the skin is an essential part of the respiratory process. If an animal be covered with varnish, impermeable by water or gases, it will die in from six to twelve hours. The cause of this has not been definitely ascertained. All that is known is that complete suppression of the functions of the skin in this manner is followed by a rapid fall of temperature and death. The fatal result is perhaps due in part to the retention of carbon dioxide and in part to the retention of some undiscovered morbific cutaneous products.

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[1] Shoemaker's "Materia Medica and Therapeutics," seventh edition, 1908.

**The Sebum.**—The sebaceous matter, or sebum, is a semi-fluid material secreted by the sebaceous glands. It is composed of free fat, fat-cells, and epithelial *débris*. It contains about 35 per cent. of water, 40 per cent. of olein and palmatin, 13 per cent. of casein, 8 per cent. of gelatin, traces of albumin and various odorous principles, and a small quantity of the chloride, phosphate, and sulphate of sodium. The function of the sebaceous glands is carried on under the influence of the nervous system.

The uses of this secretion are manifold. It preserves the normal softness and pliability of the skin, and acts as a protection to parts of the body exposed to atmospheric changes. It prevents the maceration of the epidermis that would otherwise follow profuse perspiration, lessens friction between contiguous surfaces, and protects the skin around the outlets of the body from the contact of irritating excretions. It gives lustre and pliability to the hairs, and probably contributes to their growth and nutrition.

**The Perspiration.**—The perspiratory function of the skin is of the utmost importance, as a means by which effete materials are removed, and the temperature prevented from rising above the normal. It was formerly supposed that perspiration was the product of the sudoriparous glands alone; it is now known that it is composed in large part of the water which is diffused outward from the interstices of the deeper layers of the epidermis, and becomes intermingled with the secretions of the glands. The greater part of the moisture eliminated through the skin passes away into the atmosphere without condensation upon the surface. This is known as transpiration or insensible perspiration. When the quantity is much larger, the moisture collects in drops upon the skin and forms beads of sweat, or sensible perspiration. This may occur from relaxation of the skin without hyperemia, forming a "cold sweat."

The sweat in health is a colorless fluid, saltish in taste, and slightly acid in reaction. It is composed of nine hundred and ninety parts of water and ten parts of organic and inorganic solids. The inorganic materials consist mainly of the chlorides of sodium and potassium, with some traces of iron and the earthy phosphates. The organic constituents consist chiefly of urea, fat, and fatty acids. The reaction, according to Heuss, is normally acid during rest, but becomes neutral or even alkaline when an excessive amount of fluid is secreted. Gaube has found albumen in the perspiration, together with diastasic ferments. The quantity of urea contained in perspiration under ordinary circumstances is not large, but it is enormously increased when the functions of the kidneys are suppressed, as in certain forms of Bright's disease. The odor of perspiration is partly due to the various fatty acids, and partly perhaps to some volatile characteristic substances which have not yet been isolated.

The mutual relation existing between the skin and kidneys as organs of elimination is shown by the well-known fact that when the perspiration is diminished, as in cold weather, the quantity of urine is increased, while during warm weather, when the perspiration is more abundant, a smaller amount of urine is secreted.

The production of perspiration is controlled by a special system of nerves, analogous to those which regulate the secretion of saliva, and is stimulated under normal circumstances by the presence of an increased quantity of blood in the capillaries of the skin. It may, however, be increased or diminished by the action of certain medicinal agents without regard to the condition of the cutaneous circulation. Atropine, as is well known, will check the most profuse perspiration, although it may, and frequently does, produce at the same time an intense hyperæmia of the whole surface. Opium, pilocarpine, ipecac, and other diaphoretic agents, induce free perspiration, during which the skin remains pale and cool. The cold sweats of phthisis, of syncope, and of fear also occur while the surface is pale. It is not improbable, however, that these abnormal perspirations are due to a paresis of the nerves and a relaxation of the vessels, and should consequently be regarded as an exudation rather than a secretion.

The amount of perspiration in health varies in different individuals and under different circumstances. It is decreased by cold and increased by heat. It is increased by exercise and by taking food or drink, by breathing in a confined space, by putting on additional clothing, and by all circumstances that produce an increased flow of blood through the capillaries of the skin. Peiper has demonstrated that the perspiration is more abundant upon the right side of the body, that the palm of the hand perspires four times more than that of the skin of the chest, and the cheeks one and a half times as much. The secretion slowly increases in the afternoon, especially from eight o'clock to midnight, after which there is a diminution. Food has but little influence upon the perspiration. The quantity is generally less in infants than in adults, while the weight of the body and sex are without marked influence. The effect of woolen underclothing upon the perspiration has been investigated by Lasarew, who kept a number of healthy soldiers under observation for a period of thirty days. While such underclothing was worn the amount of all substances excreted by the lungs and skin was increased and the quantity of urine decreased. The surface temperature was raised several tenths of a degree. The general temperature, pulse, and respiration remained unaltered. When linen underclothing was worn the urine was increased, and excretion from the lungs and skin diminished.[1] According to the observations of Seguin, Lavoisier, and others, the average daily amount of water removed from the body by perspiration is thirty ounces. More than this quantity may, however, be lost in an hour when the body is exposed to a very high temperature. It is by the evaporation of this large amount of water that the surface heat is lowered, and the temperature of the blood prevented from being raised to a point incompatible with life. The influence of the perspiration upon the constitution of the gastric juice and urine has been studied by Viktorin S. Grüzdeff, who experimented upon seven persons in Prof. V. A. Manassein's clinic. The loss of weight after sweating varied in different obesrvations from 120 to 1,020 grammes (3 oz. 412 grains to 32 oz. 391 grains). Free perspiration reduced the acidity, digestive power, and total quantity of the gastric juice as well as the proportion of free hydrochloric acid which it should contain. The proportion of pepsin appeared to remain unchanged. These alterations were less marked in healthy persons than in those suffering from chronic gastric catarrh. The more profuse the perspiration the more considerable was the decrease of acidity. The longer the interval between the sweating and secretion of the gastric juice the greater the decrease. The alterations in the juice may last from several hours to two days. The acidity of the urine remained unchanged.

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[1] Monatschefte für praktische Dermatologie, No. 6, 1889.

A remarkable case of post-mortem sweating has been placed upon record by Mr. John A. Cones. A man, 42 years of age, the subject of albuminuria, was suddenly seized, ten days before death, with uremic coma and left hemiplegia. The temperature was normal until within the last few days, when it ranged from 102° to 104° six hours before death, when it began to sink. It was found difficult to excite perspiration. Pilocarpine was given hypodermically in gradually increasing doses. The last injection, three days before death, produced a fair amount of sweating for about twenty minutes, but, as it gave rise to excessive bronchial secretion, was not repeated. Forty-eight hours before death, however, the patient began to perspire profusely, and this continued without interruption to the very end, even when the surface temperature was decidedly subnormal. The body was washed, and four hours later laid upon a bier, nothing unusual being noticed at the time of removal or before; but sixteen hours after death the sheets and pillows were found absolutely saturated with sweat, and the skin felt moist and clammy. This state continued for at least eight hours. The strange features of the case are the considerable time that must have elapsed after death before the secretion was poured out, at all events to any extent, and the great quantity of the fluid. The writer suggests, in explanation of the phenomenon, that as the patient had been sweating freely to the time of his death, the glands and lymph-spaces surrounding them were probably engorged with fluid, and that with the beginning of *rigor mortis* the contents of these glands and lymph-spaces had been mechanically expressed.[1]

The perspiration emanating from the axilla, the genital regions, and between the toes has a peculiar odor, which at times becomes excessively offensive, constituting the affection known as bromidrosis. It is always distinctly alkaline. Donné states that the alkalinity, as well as the odor, is due to the intermingling and decomposition of the secretions of the follicles other than those of the sudoriparous glands.

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[1] The Lancet, May 25, 1889, p. 1027.

**Electric Currents.**—M. Tarchanoff has studied the production of electric cutaneous currents in the skin of man by means of a very sensitive galvanometer, together with a special device for preventing spontaneous movements. The electrodes being in position, the production of cutaneous currents was determined under the influence of the most various excitations, a call in a loud voice, a shock, etc. The psychical sensations of heat and cold, suggested to the subject, determined extremely delicate reactions of the galvanometer. When the left hand was in contact with the electrodes, and it was suggested to the subject that his right hand was warm and commencing to perspire, no effect was observed; but when the left hand was spoken of, a considerable deviation of the needle of the instrument at once occurred. Here was an electric discharge of purely psychical origin which might to a certain extent be compared to the discharge of a ray-torpedo. In pursuing these experiments it was necessary to choose regions rich in sudoriparous glands. These glands play a notable part in the production of the cutaneous currents. A person in a state of expectant attention causes the needle to oscillate incessantly. It is necessary, before beginning the experiments, to secure the utmost tranquillity in the subject, in order to determine the zero of the galvanometer. Another example forcibly demonstrates the effect of mental effort. An easy act of multiplication produces no result; but if a person be asked to perform a difficult problem of the same kind, the needle is deflected in proportion to the difficulty. Muscular movements give rise to deviations which must be attributed not merely to the acts themselves—for the effect is disproportionate—but to the effort of will which they necessitate. The deviation is, in fact, greater when the subject looks at the tip of his nose than when he raises his arm, even if some degree of force be used. Fatigued persons produce no reaction. M. Tarchanoff thinks that the sudoriparous glands exercise a regulative influence upon the production of these cutaneous currents. He considers it a thermic regulation, favoring cutaneous evaporation and disassimilation in the course of cerebral acts and dependent upon them.[1]

**Odor.**—A perceptible odor is sometimes emitted by the skin of healthy individuals. This is more distinct in some races than in others; the negro, for instance, being characterized by a strong, unpleasant odor. This odor is more marked at some periods than at others, especially during exercise, mental excitement, or during menstruation. Apart from the smell dependent upon uncleanliness, a distinct and fragrant scent is exhaled by the bodies of some persons. In some instances the perfume has been likened to that of violets, in others it is strongly musky. Curious examples have been from time to time reported of individuals whose sense of smell was so acute that they were able to distinguish between men and women, young and old, by the sense of olfaction.

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[1] Le Progrès Médical, July 6, 1889; Medical Bulletin, November, 1889, p. 355. p. 355.

## SYMPTOMATOLOGY.

Diseases of the skin manifest themselves by local and constitutional symptoms. The constitutional vary in gravity in accordance with the amount of nutritive or functional disturbances present. In some cases they may be so slight as scarcely to attract attention, while in others they may be so serious that energetic treatment is necessary for their relief. Disorders of digestion are the most frequent constitutional symptoms of skin diseases. Disorders of menstruation are often present. Functional disturbances of the urinary and other organs may also occur, and if not remedied may lead to serious structural changes. Fever is present at times, and some forms of skin diseases are accompanied by increasing debility and progressive emaciation.

The local symptoms of cutaneous diseases are (1) subjective and (2) objective.

**Subjective Symptoms.**—The subjective symptoms of cutaneous diseases are those which can be recognized by the patient alone. They consist of alterations or anomalies in the sensation of a portion of the surface, and may be conveniently considered as pain, hyperesthesia, anesthesia, and paresthesia, shown by pruritus or itching. They vary in degree in different diseases, and are sometimes entirely absent.

The pain may be hot or burning, as in the various inflammatory affections of the skin, or it may be sharp and neuralgic in character, as in herpes zoster, neuroma, and carcinoma. Hyperesthesia, or an increased sensitiveness of the cutaneous surface, is a prominent symptom of both functional and organic derangements of the nervous centres. At times it appears to be purely idiopathic, as in dermatalgia. Anesthesia, or a diminished sensitiveness of the skin, is sometimes symptomatic of diseases of the nerve-centres, and sometimes due to local causes. It is present to a marked degree in leprosy, and is found occasionally in connection with syphilis. Pruritus, or itching, is the most frequent and most prominent of the subjective symptoms of cutaneous disease. It occurs in varying degree in a great number of affections. It may be due to the irritation of parasites, or to the reflex action of internal causes, as in jaundice and locomotor ataxia, or, as is more commonly the case, to the direct action of inflammatory or other morbid processes upon the terminal filaments of the cutaneous nerves. The sensation of itching has been carefully studied by Dr. E. B. Bronson, who has made it the subject of a paper read before the New York Neurological Association, October 7, 1890. This author believes that there is sufficient evidence to locate the essential seat of pruritus in the epiderm. The sensation may be excited by pathological changes in the epidermis or by certain conditions of the nerve-centres. Dr. Bronson called attention to the etymological relation between pruritus and prurience, and remarked that the impulse to scratch was closely akin to a lustful feeling, and one that sometimes made scratching an actual sensual indulgence. A disposition is not infrequently excited to attack the itching surface with a vehemence that amounts to a passion. This is particularly the case in pruritus of the genitalia, and serves to explain the sexual excitement or depravity associated with that condition. Such sensations, however, are not confined to genital pruritus, but may attend itching in almost any location. The writer concluded that in pruritus it is the sense of contact that is disturbed; that it primarily concerns simple cutaneous nerves or nerve-endings situated superficially and probably in the epidermis; that in pruritus the disturbance is of the nature of a dysesthesia; and that the voluptuous sensations which may attend pruritus are a manifestation of a generalized aphrodisiac sense, and represent a phase of common sensation which has its source in the sense of contract.

**Objective Symptoms.**—The objective symptoms of skin diseases are the structural lesions which become manifest upon the surface of the skin, and can be recognized by the physician as well as by the patient. They are the result of the various pathological processes which occur in the skin, and by their number and character indicate the nature and intensity of the morbid process.

They consist of primary and secondary lesions. The primary are those which are due to the direct action of various morbid processes or to the deposition of morbid products in the skin. The secondary are those which follow the primary, and are due to the softening and breaking down, or to the organization and metamorphosis of the products of disease.

THE PRIMARY LESIONS ARE: 1. *Maculæ,* macules, spots; 2. *Erythema,* hyperemia, redness; 3. *Pomphi,* wheals; 4. *Papulæ,* papules, pimples; 5. *Tubercula,* lumps, tubercles; 6. *Tumores,* tumors; 7. *Vesiculæ,* vesicles; 8. *Bullæ,* blebs; 9. *Pustulæ,* pustules.

THE SECONDARY LESIONS ARE: 1. *Excoriationes,* excoriations; 2. *Squamæ,* scales; 3. *Crustæ,* crusts, scabs; 4. *Rhagades,* cracks, fissures; 5. *Ulcera,* ulcers; 6. *Cicatrices,* scars; 7. *Chromatosis,* pigmentation; 8. *Atrophia,* atrophy. To these may be added certain enepidermic clinical phenomena, such as patches of *chromidrosis,* and *chromophytosis,* also various stains, or dyes.

## PRIMARY LESIONS.

**Maculæ, Macules, Spots.**—Macules are small, circumscribed alterations in the color of the skin, unaccompanied by any marked elevation or depression of the surface. They are usually oval or circular, but vary in form as well as in size. They vary in color also in accordance with the morbid processes of which they are the result. Those which are due to simple hyperemia of a portion of the papillary layer of the corium are red or rose-colored, and disappear under pressure. They are termed roseola, and are met with in a number of cutaneous and systemic affections. Those which are accompanied by inflammation and slight exudation are more persistent, and cannot be effaced so easily by pressure. The hyperemic or inflammatory area that encircles a cutaneous lesion is termed an areola.

Macules which are caused by hemorrhages into the skin vary in color from dark-red to purple and black, and are termed purpura. If the hemorrhagic spots are minute, they are known as petechiæ. Linear hyperemias or extravasations are called vibices. The discoloration produced by a large effusion of blood into the subcutaneous connective tissue is termed an ecchymosis.

Those which are caused by an abnormal development and dilatation of the blood-vessels of the corium may be either congenital or acquired. When they are congenital, they are termed nevi; when they appear after birth, they are known as telangiectases. They vary in color from scarlet to violet, and do not disappear under pressure.

If due to an excessive amount of pigment in the skin they are yellow, brown, or black in color, as in lentigo, chloasma, and nevus pigmentosus. The latter is most frequently congenital, as in the so-called "mother's marks," but lentigo and chloasma are invariably acquired.

When produced by a deficiency of pigment they are white in color, and constitute the disease known as leucoderma. Congenital deficiency of pigment involving the general skin surface and the hair, is known as albinism.

Macules produced by the microsporon furfur, a vegetable parasite, are yellow or yellowish-red in color, and are characteristic of the disease called pityriasis versicolor. If due to the action of heat, or various chemical substances, they may present all shades of colors.

If the alteration in color is uniform, and involves all or a large portion of the skin, it is termed a discoloration. This pathological condition is the prominent symptom in jaundice, chlorosis, morbus ceruleus, and argyria. It is also present in chronic malaria, leprosy, carcinoma, Addison's disease, and in some forms of ovarian and uterine diseases.

**Erythema, Hyperemia, Redness.**—Erythema is a diffused redness of a portion of the surface of the skin produced by an active congestion of the capillary plexuses of the corium. It differs from roseola in size, and in the greater intensity of its exciting cause. The congestion in roseola is frequently passive, and is manifested at isolated points on the surface. The congestion in erythema is invariably active, and involves one or more groups of contiguous vessels. It is also accompanied by more or less heat, swelling, and pain.

Erythema may be produced by external causes, as by exposure to the sun's rays or other source of heat, or to Röntgen rays or by friction or other irritation. At other times it is due to internal causes alone. It is always a prominent symptom in the diseases with which it is associated, and is frequently so severe as to demand special treatment. Sometimes it appears to be the only lesion, and constitutes the disease itself.

Passive congestion, as shown by dilated capillary vessels, due to venous obstruction or a weak circulation, can readily be distinguished from erythema, by the contrast between the comparative coldness and dull, blue color of the skin in the former, and the heat and fiery redness of the surface in the latter. By making pressure upon part of the surface with the end of a finger, and suddenly lifting it up again, the blood can be temporarily emptied from blood-vessels, and they refill slowly if they are merely congested; but in inflammation, the redness returns almost immediately when the pressure is removed. When there is subcutaneous hemorrhage, the spot will not disappear at all under pressure.

**Pomphi, Urticariæ, Wheals.**—Wheals are flattened, oval, or circular elevations of the skin, rapid in formation, usually evanescent in character, and attended by intense itching. They vary from a few lines, to an inch or more in diameter. They are usually white or pale-red in color. Frequently they are pale in centre and red at the periphery. They may appear singly, but generally several are developed simultaneously. Those that are adjacent to each other manifest a tendency to coalesce and form a large patch of irregular shape.

Occasionally gyrate figures result from disappearance of the centre, together with increase at the periphery, and coalescence with neighboring wheals. They are attended by a sensation of heat or tingling. Scratching or rubbing only serves to increase and enlarge them. The distinctive peculiarities of wheals are their extremely rapid development, the brief period during which they remain upon the surface, and the sudden manner in which they generally disappear.

They are caused by a dilatation of the capillaries and an exudation of serum into the interstices of the corium and rete mucosum, followed by a spasmodic contraction of the tissues around the periphery of the exudation. As soon as the local spasm subsides, the exudation is absorbed, and the wheal vanishes almost as suddenly as it was formed. Sometimes a little blood may be found mingled with the serum. Occasionally the amount of exudation is so great as to form a bulla, as in urticaria bullosum, or a node, as in urticaria nodosum.

**Papulæ, Papules, Pimples.**—Papules are small, solid elevations of the skin, of new formation, ranging in size from a mustard-seed to a split pea. They may be of any color from red to black, and are either round, flat, or conical in form. They occur in a great many diseases, and are due to a number of different pathological processes. Papules are usually accompanied by more or less desquamation. Sometimes they are due to an excessive growth and accumulation of epidermic cells around the orifices of the hair-follicles, as in keratosis pilaris. At other times they are caused by retention of sebum, as in milium and comedo. They may also be due to an abnormal development of the papillæ of the corium, as in verruca and ichthyosis, or to a hyperplasia of the rete mucosum, as in psoriasis and cornu cutaneum. The most common variety of papules are those which occur in acne and eczema, and are due to inflammation and plastic exudation into the skin. Papules may also be produced by cell-infiltration, as in syphilis, or by a new cell-growth, as in lupus and carcinoma. Occasionally they are produced by hemorrhage, as in purpura papulosa. Those which are the result of the inflammatory process are usually attended by more or less itching, and they frequently become converted into vesicles or pustules. As they recede in size and elevation, their color gradually fades, but spots of varied tints are generally present for a considerable period, indicating the former location of papules.

The papule is one of the most important of the primary cutaneous lesions since it is of such common occurrence due to so many causes, and since it may be transformed into other primary and secondary lesions. Papules contain no fluid, but are produced by an aggregation of cells. They are slightly compressible. The color of papules varies according to the disease of which they are a manifestation, and according to the stage of the disease. Their hue is generally bright in acne, eczema, and psoriasis; crimson or violet in lichen planus; copper-colored in syphilis; while in urticaria and prurigo they present the normal color of the skin. In some instances they develop rapidly, and the surface is soon covered; in others they make their appearance gradually and in successive crops. Papules may occur upon any portion of the body, but in certain diseases they exhibit a predilection for special regions. Thus, in acne, they are most often seen upon the face. The papules of eczema attack the flexor surfaces of the limbs, the trunks, and the face; while those of psoriasis invade the extensor surfaces of the limbs and other regions in which the epidermis is thick. The distribution of this lesion is varied, though a certain symmetry of arrangement can usually be traced.

**Tubercula, Tubercles.**—Tubercles are solid elevations of the skin, of new formation or large pimples, varying in size from a split pea to a hazelnut. They are of different colors, but are usually reddish, or flesh-colored. They are generally circular or oval, but may be flattened or irregular in outline. They are caused by an intensification of the same morbid processes which are concerned in the production of papules, and differ from them only in their greater size. In fact, the line of distinction is mainly an arbitrary one. Many of the tubercles met with in disease begin as papules, and by involving deeper tissues and spreading over a greater extent of surface develop into tubercles. Syphilis, leprosy, lupus, and carcinoma often present typical examples of this metamorphosis.

Tubercles undergo various changes after the acme of their development has been reached. Those which are purely inflammatory may proceed to complete involution by absorption of their contents and desquamation of their epidermic covering. If due to the retention of sebum, they may become indurated by calcification of their contents, or they may soften and suppurate. Syphilitic tubercles usually terminate in ulceration. Tubercles due to neoplastic growths generally end in ulceration, but occasionally they manifest a disposition to remain without undergoing any change whatever.

**Tumores, Tumors.**—Tumors are large, solid elevations of the skin, of all sizes from a hazelnut to a cocoanut, or even larger. They are generally spherical or rather hemispherical in form, but may be cylindrical or flattened. They are usually flesh-colored, but at times are brown or black. They generally arise from the corium, or the subcutaneous connective tissue, and by their outward development raise the epidermis to a considerable degree above the surrounding surface. They are due to a number of pathological processes. Among the more frequent exciting causes are new growths in the corium, and degeneration of the sebaceous glands, with exudation and extravasation into the surrounding tissues. Large tumors are sometimes formed by retention of sebum, and the gradual distention and hypertrophy of the sebaceous glands. The tumors may become malignant.

**Vesiculæ, Vesicles.**—Vesicles are small, round, or conical elevations of the epidermis, or blisters, in dimension from a mustard-seed to a split pea, and contain serum, or a sero-purulent or bloody liquid. They vary in color in accordance with their contents. The typical vesicle is transparent, and contains pure serum unmixed with either pus or blood. Those that contain leucocytes or pus-corpuscles are white or opaque, and those in which blood is present are dark or dark red in color. Their walls are tense when they are completely filled with fluid, and flaccid when they are only partially filled. They may be superficial or deep-seated. Those that are superficial are situated between the horny and mucous layers of the epidermis. The others are formed between the strata of the rete mucosum. The superficial vesicles rupture easily. Those which are developed in the rete mucosum are surrounded by thicker walls, and consequently are more resistent and tenacious.

Vesicles are of inflammatory origin as a rule, and are due to an exudation of fluid from the vessels of the papillary layer of the corium. As the exudation is poured out, it passes through and distends the intercellular spaces of the mucous layer of the epidermis, and forms a vesicle by elevating the upper layer of the stratum mucosum, or the stratum corneum. Occasionally they are produced by simple retention of perspiration, as in miliaria or sudamina. They may be either simple or compound. The former consist of one chamber, as in herpes, or eczema; the latter are composed of two or more, as in varicella. Vesicles seldom occur singly; they are generally developed in considerable numbers, and are met with in a variety of diseases and on all parts of the body. They may be arranged in groups, as in herpes, or irregularly distributed, as in eczema. They are brief in duration, and end by rupture of their walls and escape of their contents, or by absorption of the fluid and desquamation of their roof; or else they become filled with pus-cells, and transformed into pustules.

**Bullæ, Blebs.**—Blebs are large oval or spherical elevations of the epidermis, in size from a split pea to a small cocoanut, and contain a serous, sero-purulent, or bloody fluid.

Bullæ may be regarded as enlarged vesicles. Their color depends upon the character of their contents, and varies from clear or light-yellow, in those that contain only serum, to dark red or black in those in which an extravasation of blood has taken place. In consequence of their rapid formation their walls are usually distended at first, but when absorption begins they soon become flaccid. Bullæ consist, as a rule, of but one chamber. Compound bullæ, which are occasionally met with, contain two or more chambers, and are due to the coalition and enlargement of a group of adjacent vesicles. Like vesicles, they are situated between the horny and mucous layers of the epidermis, and are produced by a sudden and overwhelming exudation from the vessels of the corium. Ordinarily they do not rupture as easily as vesicles, but in pemphigus foliaceus they burst before they are fully formed. Sometimes they are attended by marked itching or burning sensations; at other times they are not accompanied by any subjective symptoms whatever. Bullæ are met with in pemphigus and pemphigoid eruptions, syphilis, leprosy, herpes iris, and in some cases of erysipelas and acute dermatitis, notably in rhus poisoning. They are sometimes surrounded by an inflammatory areola, but frequently rise abruptly from the surface of apparently healthy skin.

**Pustulæ, Pustules.**—Pustules are round, flat, or conical elevations of the epidermis, varying in size from a mustard-seed to a cherry, which contain pus. They are inflammatory in origin, and are usually produced by the migration and proliferation of lymphoid corpuscles from the vessels of the corium. They are generally yellow or yellowish-white in color, but are occasionally dark from hemorrhagic exudation. They have been arbitrarily divided into primary and secondary. The secondary are those which are developed from pre-existing papules or vesicles. The primary are those in which the preceding stages of congestion and exudation are so brief that they escape notice until suppuration is complete, and the resulting pustule appears to be the original lesion. Pustules may originate in the sebaceous glands, as in acne; or in the hair-follicles, as in sycosis; or in the papillary layer of the corium, as in impetigo, ecthyma, and eczema pustulosum. They may also develop in the horny and mucous layers of the epidermis, as in variola, or deep in the corium and subcutaneous connective tissue, as in furuncle and anthrax. They are usually encircled by an inflammatory area, and are occasionally attended by marked itching or burning sensations. Sometimes they are extremely painful, but generally they are not accompanied by any marked subjective symptoms. They may be simple, as in acne, or compound, where they contain two or more chambers, as in variola. Pustules are of comparatively brief duration, and end by absorption, or by rupture of their walls and discharge of their contents. If the suppurating process has been limited to the epidermis, no deformity will result; but, if a considerable portion of the corium has been destroyed, permanent scarring or pitting will ensue, as in variola, syphilis, and severe cases of acne. Pustules are encountered in acne, sycosis, ecthyma, impetigo, variola, scabies, syphilis, and eczema. They may also be produced by traumatism, and by the application of croton oil, tartar emetic, and other irritating substances to the skin.

### SECONDARY LESIONS.

**Excoriationes, Excoriations.**—Excoriations are losses of substance from the superficial layers of the skin resulting from traumatic causes. They vary in size and shape, but generally consist of torn points or linear furrows from which minute particles of blood and serum are oozing, or which have dried up and formed a crust over the lesions. Ordinarily they do not extend beneath the mucous layer of the epidermis, although at times they may involve the upper portion of the corium. They usually heal rapidly without the formation of a cicatrix.

Excoriations are occasionally produced by superficial incised wounds or by accidental lacerations or abrasions of the surface; but in the great majority of cases they are the direct result of excessive scratching caused by the itching and irritation of a cutaneous affection. As itching is a prominent symptom of a number of skin diseases, excoriations are frequently observed, and at times render important assistance in establishing a diagnosis. They occur most abundantly in prurigo, pruritus, chronic urticaria, eczema, scabies, and pediculosis.

**Squamæ, Scales.**—Scales are masses of dead epidermis which have been completely or partially separated by disease from the underlying strata. They are usually white or gray in color, but may be yellow or brown. They differ in form and size and also in number, in accordance with the situation, and the intensity of their exciting cause. When the morbid process which produces them is superficial, they are small and scanty; when it is deep-seated, they are larger and more abundant. They are met with in various parasitic and inflammatory affections, and in diseases due to perverted nutrition of the epidermis. They are thin, fine, and branny in pityriasis, seborrhea sicca, and some forms of eczema. In psoriasis they form large masses of a white pearly color, while in ichthyosis they form thick plates. In scarlatina, and other diseases, the epidermis is sometimes cast off in large parchment-like masses several inches in diameter. This extensive exfoliation is termed desquamation in mass, in contradistinction to the process of formation and detachment of fine branny scales, which is known as furfuraceous desquamation.

**Crustæ, Crusts, Scabs.**—Crusts or scabs are solid masses formed by the drying up of exuded or extravasated fluids, or by the collection on the surface of dead epithelial cells, sebaceous matter, and various fungous elements. They vary in color as well as in size and form. Those which are formed by the drying up of a serous exudation, as in vesicular eczema, are thin and yellow or light-colored, and have no definite form. Those which result from the drying up of pus are thick and green, or dark yellow in color, and are of the same form as the ulcer or broken-down pustule upon which they are seated. When blood is mixed with the exudation, the crust will be reddish or black. Syphilitic crusts are thick and hard and dark green or black in color, and usually present a lamellated appearance. Crusts formed by the drying up of sebaceous material vary in color from light to dark yellow, and can be recognized at once by their greasy appearance. The crusts produced by the favus parasite are cup-shaped, yellow, or sulphur-colored, and exceedingly friable.

**Rhagades, Cracks, Fissures.**—Cracks or fissures are linear cleavage lesions or wounds of the skin produced by muscular action. They are usually limited to the horny and mucous layers of the epidermis, but may extend a short distance into the corium. They are caused by muscular contraction acting on a portion of the skin, which from inflammatory infiltration or abnormal dryness has become inelastic or brittle, and ruptures instead of yielding. They may occur on any part of the surface which is exposed to tension, but are observed most frequently on the knuckles, the palms of the hands, the soles of the feet, the knees and elbows, and at the angles of the mouth. They are of different lengths, and may run in a straight or irregular direction. Deep fissures bleed readily, and are accompanied by more or less pain, which is aggravated by motion.

Fissures are present in psoriasis, eczema, lichen ruber, scleroderma, and syphilis. They may at times be produced by the use of strong soaps, or by the action of cold and other irritants.

**Ulcera, Ulcers.**—Ulcers are inflammatory breaches of continuity due to suppurative destruction of the superficial tissues. Pathogenic, or infective, micro-organisms of various kinds share in the causation and maintenance of these lesions, which are usually seated in the upper portion of the corium, but may extend into the subcutaneous connective tissue. They vary much in size and shape. Small ulcers are usually circular; large ulcers may be round or oval, but are often serpiginous or irregular in outline. The walls of an ulcer are either perpendicular or sloping, and are frequently undermined. The base may be smooth, but is generally uneven, and is covered by a more or less copious secretion of pus. Ulcers may occur on any part of the body, but they are found most frequently on the lower extremities. They vary in color from light-red to dark-purple, according to the intensity and character of the inflammation of which they are the result. They are surrounded by a zone of congestion, and manifest a tendency to enlarge in breadth rather than in depth. Ulcers occur in syphilis, lupus, leprosy, carcinoma, anthrax, furuncle, scrofula, actinomycosis, blastomycosis, and several other diseases. They may also be produced by any local cause which seriously interferes with the circulation. They are always secondary to other lesions, and may run an acute or chronic course. They heal by granulation and the formation of a cicatrix, which sometimes remains permanently. Ulcers are attended by more or less pain.

**Cicatrices, Scars.**—Scars are new formations of connective tissue which occupy the place of lost normal tissue of the skin. They are covered by a thin layer of epidermis, and are supplied with blood-vessels and lymphatics, but never contain any hair-follicles or glands. They are of a pale-red color at first, but generally become white in the course of time. Large cicatrices range in color from gray to brown. Superficial cicatrices are smooth, soft, and freely movable; those deeper seated are hard, uneven, and immovable. Those raised above the surrounding surface are termed hypertrophic cicatrices; those on a level with it are called normal cicatrices; those which are depressed beneath it are known as atrophic cicatrices. Cicatrices are not characteristic of any one morbid process; but are the result of all forms which produce extensive destruction of the corium. They are met with in all the suppurative diseases, and may follow severe burns, wounds, and other injuries. Their size and form depend upon the nature and extent of the preceding ulcerative or traumatic lesions. They are generally permanent, although occasionally they may be slowly obliterated. They are not supplied with nerves, and in consequence are generally devoid of sensation; but in some rare instances they are the seat of excruciating pain. This is due, however, to pressure of the contracting new tissue on a nerve-fibre which has been accidentally inclosed in it. Atrophic cicatrices that are multiple, and bean-, or kidney-shaped, are generally the result of syphilis.

**Pigmentation.**—Pigmentation is an augmentation in color of a considerable portion of the skin. It may be of brief duration, or remain permanently. It may be due to chronic inflammation, or long-continued congestion. Sometimes it is caused by the formation of neoplasms in the skin, and at other times appears to depend upon trophic disturbances. Typical instances are presented in Addison's disease, and as a result of excessive scratching and continuous hyperemia in pediculosis. Bronzing has been observed in certain cases of diabetes, described originally by MM. Hanot and Chauffard. The discoloration is most marked upon the face, limbs, and genitals. Pigmentation of a brownish character may occur in the form of large patches, during pregnancy, usually limited to the face, and vertical median line of the abdomen. The deposit may be more unequally and irregularly distributed over the chest, abdomen, and thighs. It is sometimes associated with disease of the pelvic organs, and with exophthalmic goitre. Scattered spots of pigmentation have been witnessed in epilepsy and insanity. Small blue spots may be seen in the mucous surface of the mouth, in the early stage of the eruption of measles, as pointed out by Koplik.

Kaposi expresses the belief that, though hemoglobin is in many cases the source of the pigment, yet in others the color is due to a pigment-forming function of other protoplasmic bodies, particularly to the lowest layer of the rete mucosum. This opinion receives support from investigations upon trout and frogs. The changes of color manifested in these animals under different circumstances depend upon alterations in the form and activity of the pigment-cells, the changes being under the influence of the sympathetic nervous system. The blue spots attending lousiness have been attributed to the excrement of the lice deposited under the horny layer of the skin. Local discolorations upon the skin surface may be produced by colored sweat (chromidrosis), or by certain vegetable parasites (chromophytosis).

## DIAGNOSIS.

The importance of making a correct diagnosis in all cases of cutaneous affections cannot be overestimated. No satisfactory plan of treatment can be formulated unless the disease be definitely recognized, and an endeavor made to ascertain its cause.

The diagnosis of skin diseases is not difficult, as a rule. The most essential requisite for success in this respect is a thorough knowledge of the cause and mode of development and termination of the various diseases of this class, and of the significance of the lesions that occur in the progress of each. Valuable assistance may also be derived from a careful consideration of the patient's personal and family history.

In order to elicit all the information possible in reference to each case, a systematic method of examination should be adopted.

**Light.**—Abundant daylight is indispensable for the proper examination of the diseased cutaneous surface. Many of the macular eruptions, which then can readily be perceived, appear indistinct or may escape recognition in the twilight, or in an imperfectly lighted room. Artificial light, no matter how brilliant or from what source it may be derived, should be avoided, as it always gives an unnatural color to the skin, and adds to the difficulty of making a correct diagnosis.

**Temperature of the Room.**—The temperature of the examining room should be maintained at about 70°. Variations above and below this point modify the color of the skin, change the appearance of the eruption, and may be uncomfortable or injurious to the patient.

**Inspection.**—In order to make a correct diagnosis, every portion of the affected surface should be examined. Some diseases present so many points of resemblance that the differentiation between them cannot be made without a critical and comprehensive observation of all their features. There is a natural reluctance on the part of many patients to permit an examination of certain parts of the body, but this difficulty can be overcome by the exercise of a little tact. If the eruption be diffused, and the patient be a man or a child, the clothing should be removed, and the entire surface exposed to view.

All deviations from the normal color or appearance of the skin should be carefully noted. In some diseases the surface is dry and scaly, while in others it presents an extremely greasy and glossy appearance. It should be observed whether the natural lines and furrows of the skin are lessened or exaggerated in size; whether the orifices of the sebaceous ducts are closed or patulous; whether the growth of hair is more or less abundant than normal, and whether the individual hairs present a healthy or an unhealthy appearance. It should also be observed whether the sebaceous and sudoriparous secretions are profuse or scanty. The degree of muscular development and the amount of adipose tissue present should also be taken into consideration.

**Palpation.**—The information obtained by palpation is of the utmost importance, and is frequently indispensable to the formation of a correct diagnosis. By it we can recognize whether the skin is cold or hot, dry or moist; whether it is smooth and soft, or rough and hard; and whether it is abnormally loose and thin, or thickened and infiltrated. By palpation we are also enabled to determine whether the abnormal redness of the skin which is present in many affections is due to simple capillary congestion or to hemorrhagic extravasation; and whether the various exudative collections are fluid or solid in character. We can also ascertain by it whether the hairs are brittle and loose, or strong and resisting, and firmly imbedded in their follicles.

**Odor.**—Valuable information is sometimes afforded by the sense of smell. The offensive odor of bromidrosis, the ammoniacal odor of uridrosis, and the peculiar odor of favus and small-pox, are so characteristic that a diagnosis can often be made in these diseases by the smell alone.

**Constitutional Symptoms.**—The majority of skin diseases are not accompanied by severe constitutional symptoms. Disorders of the alimentary canal are frequently met with, and pain is a prominent feature of herpes zoster and several other cutaneous affections, but high fever and general malaise rarely occur except in connection with the exanthemata. It must be remembered, however, that the eruption of secondary syphilis is sometimes preceded by marked pyrexia, and that severe forms of eczema, pemphigus, urticaria, erythema nodosum, pityriasis rubra, and lichen ruber, may be attended by violent constitutional disturbances. Anthrax, furuncles, and erysipelas are also accompanied by more or less fever and pain.

**Age.**—The age of the patient is an important factor in making a diagnosis. Some diseases are most frequently met with during infantile life, some occur only at the age of puberty and in young adults, while others are found only in advanced age. Acne, for instance, rarely occurs before puberty, psoriasis has never been observed in an infant, while epithelioma seldom occurs before the thirtieth year, and is most frequent from the fiftieth to the seventieth.

**Sex.**—The sex of the patient should also be taken into consideration. Owing to the differences in habit and modes of life and constitutional peculiarities of the two sexes, some diseases are found more frequently in males, others in females. Sycosis is found only in men.

**Temperament.** — The temperament or natural constitution of the patient should be carefully observed, as it is well known that some diseases manifest a predisposition to attack persons of a certain temperament in preference to those of a different type. Psoriasis, erythema nodosum, and chronic eczema generally occur in those of a gouty or rheumatic diathesis. Intertrigo, impetigo, and pustular eczema are more commonly met with in lymphatic patients, while diseases of the sebaceous glands are more frequent in those of a nervous temperament. Scrofulous manifestations are seen in patients suffering with tuberculosis.

**General Condition.**—The general condition of the patient's health should be carefully ascertained. This can only be done properly by thoroughly investigating the manner in which the functions of the organs of digestion, assimilation, secretion, and excretion are discharged. The tongue should be examined, and the condition of the mouth and breath observed. Attention should then be directed to the stomach, and any disturbance of its functions noted. Inquiry should finally be made as to the present and usual state of the bowels. Irregularities of the menstrual function should be noted. Important assistance may sometimes be derived from information obtained by making an examination of the urine.

**Habits.**—The habits of the patient should be carefully inquired into. Many a doubtful point may be cleared up by ascertaining whether the patient is an inveterate smoker, or indulges in alcoholic or sexual excesses, or is accustomed to use cosmetics.

**Occupation.**—The occupation of the patient sometimes points directly to the diagnosis. Blacksmiths, bricklayers, cooks, and grocers frequently suffer from erythema and eczema. Butchers, hide-dealers, and wool-sorters are especially liable to be attacked by boils and carbuncles. Acne is common among persons who leads a sedentary life. Various forms of dermatitis occur among workers in dye-stuffs and other chemicals. Peculiar forms of eruption have also been noticed in those who are employed in oil-refineries and tar-distilleries.

## SUBJECTIVE SYMPTOMS.

The subjective symptoms are of the utmost importance, and frequently render valuable assistance in making a diagnosis. Inflammatory diseases, as a rule, are attended by more or less pain and itching. Syphilitic eruptions, on the contrary, may be free from both. Herpes zoster and some other diseases are characterized by intense pain. Anesthesia, paresthesia, and hyperesthesia are symptomatic of disorders of innervation.

## OBJECTIVE SYMPTOMS.

**General Appearance of the Disease.**—The general appearance of a cutaneous affection is almost invariably characteristic of that affection alone. In some diseases the eruption is uniformly macular, in others it is papular, in others again it is purely vesicular or pustular, while in some, two or more varieties of lesions may be noticed at the same time. By careful study of the origin and manner of development of the various diseases, however, the difficulties of the subject will disappear, and such proficiency will be obtained that a fairly correct diagnosis can be made in the majority of cases from the objective symptoms alone.

**Duration.**—The duration of the eruption is a matter of considerable importance. Some diseases, as lupus, are essentially chronic in character; others, as roseola and erythema, tend to disappear within a comparatively short time. Inquiry should also be made as to whether the eruption ever occurred before, and, if so, how often.

**Color.**—The color of the eruption is a valuable aid in making a diagnosis. The raw-ham or copper color of syphilitic eruption is characteristic. Patches of chloasma vary from dark yellow to brown. Xanthoma is yellow in color. Tinea versicolor varies from light yellow to reddish brown.

**Arrangement.**—The form and arrangement of the lesions should be carefully observed. Those of lichen planus, herpes zoster, herpes iris, and the various forms of tinea, are characteristic in both respects.

**Location and Extent.**—The location and extent of the lesions often point unerringly to the diagnosis. Some diseases are confined to certain regions of the body, while others involve the whole surface.

**Individual Lesions.**—The size, shape, and mode of evolution of the individual lesions should be carefully observed, but too much importance should not be attached to trifling irregularities in their appearance or development. A correct diagnosis can be made only by a comprehensive review of the whole eruption and its accompanying symptoms.

**Microscopic Examination.**—Important assistance may be obtained in many doubtful cases by making a microscopic examination of a section of the affected skin. The various parasitic diseases may be recognized in this way, and a distinction made between lupus exedens and epithelioma.

**Skiagraphy.**—For superficial conditions, such as exist in diseases of the skin, where there is a direct opportunity afforded for inspection, there is not much opportunity for the use of the x-ray in diagnosis, although the field for usefulness in therapeutics is already a wide one. The behavior of certain lesions under irradiation may indicate their true character where this had been previously in doubt. Thus ordinary infiltrations of the skin may disappear so much more rapidly and completely than malignant forms that this may have diagnostic value, in some cases, between benign, tuberculous (scrofulous), sarcomatous, or cancerous lesions.

## PATHOLOGY.

The skin is subject to the same morbid processes as other portions of the body, and also to others which are peculiar to itself. It consequently presents a variety of pathological changes, the most important of which are anemia, hyperemia, inflammation, hemorrhage, hypertrophy, atrophy, and the formation of new growths. Both epithelial and connective-tissue layers of the skin may be involved in these changes, but the corium is usually primarily, and principally, affected because of its abundant nervous and vascular supply. The skin is also attacked by numerous animal and vegetable parasites, and is sometimes the seat of various neurotic or trophic disturbances. Functional disorders of the sebaceous and sudoriparous glands frequently occur, and structural alterations of the glands and their ducts are also often observed.

The skin-appendages, the hair-follicles, the hairs, and the nails, are also subject to various pathological changes, which may be idiopathic in character, or secondary to those which affect the adjacent cutaneous structures.

**Anemia.**—Anemia of the skin is the result of a deficient amount of blood in the cutaneous capillaries. It may be symptomatic of disease or may be due to excessive loss of blood from the general system by hemorrhage. It is characterized by unnatural pallor, which may be succeeded by a yellowish or greenish hue, involving all or a great portion of the skin. It is usually attended by a decrease in the surface temperature, and may be accompanied by profuse flow of perspiration. In many cases of general cutaneous anemia, the normal sensibility of the skin is altered, being usually diminished. The changes of color depend upon the loss of hemoglobin, since Preger has shown by his spectroscopic experiments that a concentrated solution of hemoglobin transmits only the red rays, while weak solutions transmit the yellow and green rays.

A partial cutaneous anemia may occur in any portion of the body under the influence of various agencies capable of exciting constriction of the capillary vessels. The effect may be direct, through reflex mechanism or by impairment of nutrition. Among the causes of partial anemia of the skin may be mentioned cold, local anesthesia, injury, and certain trophic disorders.

**Hyperemia.**—Hyperemia of the skin is caused by congestion of the blood-vessels of the corium. It is usually active in character, but may be passive. Active hyperemia may be produced by internal causes, or by the action of heat, cold, or other external irritating influences. It is characterized by a, more or less diffused, bright-red color of the skin, which can be effaced by pressure, but returns as soon as the pressure is removed. It is accompanied by a sensation of tingling or burning, and at times by considerable elevation of the temperature of the surface of the affected part. Active hyperemia is of comparatively brief duration. The excess of blood is usually diverted into other channels, the congestion subsides, and the skin regains its normal appearance without the production of either desquamation or pigmentation. If the congestion remain for any length of time, exudation is apt to occur, and the hyperemic process passes into inflammation.

Passive hyperemia may be due to simple relaxation of the capillaries, or to any local or systemic interference with the venous circulation. It may be frequently observed on the lower extremities, and is often followed by permanent pigmentation.

**Inflammation.**—The minute phenomena of cutaneous inflammation are identical in character with those which accompany inflammation of any other organ. There is a preliminary stage of active congestion during which the arterioles of the affected part are dilated, and the flow of blood through them is accelerated. This stage is of varying duration, but is always present. It is succeeded by retardation of the blood-current, and softening or relaxation of the walls of the capillaries. Exudation of the liquor sanguinis then occurs, followed by migration of the white and red corpuscles, and complete stasis of the circulation. The inflammatory process varies, however, in accordance with the diathesis of the patient and the nature and intensity of the exciting cause, and may be interrupted or modified at any period of its development. In some diseases, as in herpes and vesicular eczema, the effusion is a serous fluid composed almost entirely of liquor sanguinis, and contains very few corpuscles. In diseases characterized by the formation of papules and tubercles, it is semi-solid, and composed almost altogether of cells; while in pustular diseases it consists largely of pus-corpuscles and liquor puris.

Cutaneous inflammations always originate in the corium, or subcutaneous connective tissue, and involve the epidermis secondarily. They are accompanied by more or less discoloration, heat, swelling, and pain. They terminate by absorption and resolution, or by suppuration and discharge of the effused material, or by its organization and conversion into new tissue. They may be either acute or chronic in character.

**Hemorrhage.**—Cutaneous hemorrhage may occur by diapedesis, but, in the great majority of cases, it is the result of rupture of the capillaries of the corium. In some rare instances the escaped blood oozes out upon the surface of the skin; but usually it is extravasated into the substance of the corium or the subcutaneous connective tissue. The amount of the hemorrhage is influenced by the condition of the vessels, the plasticity of the blood, and the intensity of the exciting cause. In some cases it is limited to a few drops, in others it may be so large that one or more aggregations of several ounces each may be formed. The minute extravasations are usually circular, but are occasionally linear in form; the large extravasations are of all shapes and sizes. Occasionally they may be caused by bites of insects. Small spots are called petechiæ, larger ones vibices, or ecchymoses. When a considerable quantity of blood is effused, the epidermis may be elevated by it, and hemorrhagic papules, vesicles, and tubercles formed; but in the majority of cases the hemorrhagic spots are not raised above the surface of the surrounding skin.

They can readily be distinguished from pigmentary deposits by the suddenness of their appearance, and, unlike the discolorations produced by capillary congestion, they cannot be effaced by pressure. They vary in color from dark red to purple at first, but change to black, yellow, green, or brown, before they disappear. They are usually of comparatively brief duration, and are entirely removed by absorption in a few weeks. Sometimes a slight permanent discoloration may remain, but this is of rare occurrence.

**Hypertrophy.**—Hypertrophy consists of an abnormal increase in size of the normal tissues. It may be produced by an excessive development of the pre-existing elements, or by the formation of new elements of the same tissues. It may be limited to one of the layers of the skin, or occur simultaneously in all three layers. In callosities, the epidermis alone is involved. In ichthyosis, clavus, cornu cutaneum, and verruca, hypertrophy of both the epidermis and the corium occurs. Lentigo, chloasma, and nevus pigmentosus are caused by an increase in the amount of pigment in the rete mucosum. The epidermis, the corium, and the subcutaneous connective tissue are all involved in elephantiasis arabum, while in scleroderma the morbid process is limited to the corium and subcutaneous connective tissue.

Hypertrophy of the substance of the hair and nails occurs under various circumstances.

**Atrophy.**—Atrophy is a decrease in either the size or number of the elements of a tissue. When it affects only the size of the tissues, it is termed simple atrophy; when their number is lessened, it is known as numerical atrophy. It may involve the greater portion of the surface, as in senile atrophy; or it may be limited to a few spots, as seen in the local disappearance of the pigment layer in vitiligo. It is most frequently observed in connection with the appendages of the skin, as in canities and alopecia, and in atrophy of the nails. It is probably due to a disturbance of the trophic system.

**New Formations.**—New formations are produced by the deposition of new material and the development of new tissues in the substance of an organized structure. They may be composed of simple connective tissue, like the part in which they are developed, or they may consist entirely of abnormally arranged cellular material. The former are found in xanthoma, keloid, and molluscum fibrosum and cicatrices, and are benign in character. The latter occur in lupus, leprosy, carcinoma, sarcoma, syphilis, and rhinoscleroma, and are malignant in the majority of cases.

The lymphatics, blood-vessels, and nerves are sometimes invaded by new formations, as in lymphangioma, angioma, and neuroma.

**Parasites.**—The skin is infested at times by animal and vegetable parasites, which prey upon its structures and produce more or less annoyance and inflammation by their presence and habits. The animal parasites which are most frequently met with are the *Pediculus,* or louse, and the *Sarcoptes scabiei,* or itch-mite. The *Cimex lectularius,* or bed-bug; the *Pulex irritans,* or common flea; the *Pulex penetrans,* or sand-flea, and various other insects, also attack the skin and produce considerable irritation.

The vegetable parasites are microscopic fungi which attach themselves to the skin, and continue to develop on its surface. They rarely penetrate between the layers of the epidermis, but they frequently invade the hair-follicles and attack the hairs. They sometimes attack the nails also.

Three varieties of vegetable parasites have been recognized. They are the *Microsporon furfur,* which produces the disease known as tinea versicolor; the *Achorion Schönleinii,* the fungus of tinea favosa; and the *Trichophyton,* the fungus of tinea circinata, tinea sycosis, and tinea tonsurans. They act in varying degree as irritants to the skin. Tinea versicolor is a trivial affection, but tinea sycosis and tinea tonsurans may produce extensive inflammation and suppuration. Tinea favosa may be followed by permanent loss of hair.

The development of bacteriological research has inevitably modified and enlarged our conceptions of the etiology and pathogenesis of diseases of the skin. It has been already clearly demonstrated that very many are, either directly or indirectly, the results of infectious processes. It is reasonable to assume that the list of infectious dermatoses will be extended considerably from the investigations constantly being carried on by numerous and independent observers. Clinical facts had already assured us that cutaneous manifestations were in many instances excited by the presence in the blood of products of tissue change. Being retained within the organism, these substances have the power of exciting disease in the integument as well as in other tissues. The eruption in this group of cases, consequently, is but a part of a general disorder, such as gout, rheumatism, diabetes, syphilis, scrofula, or tuberculosis. These diseases are engendered by chemical compounds elaborated within the body, and not necessarily or always of microphytic origin. In another class of cases the cutaneous malady seems to depend upon the direct action of micro-organisms which have lodged upon the skin, and there found a fitting soil for development. It is probable that here as elsewhere the two causes are often conjoined, and that, as a rule, the skin only proves a fitting soil when its vitality has been previously impaired by causes acting from within the organism. External agencies, also, such as heat, cold, clothing, and personal uncleanliness, have their share of influence in preparing a field upon which parasitic organisms may flourish.

In some instances, therefore, disease of the skin is but one of the many consequences of a systemic infection, and, though valuable in itself as a diagnostic sign, is generally of less importance than the derangement of more important organs. Such is the case in the eruptive fevers, syphilis, tuberculosis, and leprosy. On the other hand, in certain forms of eczema, in acne, furuncle, carbuncle, acute abscess, some forms of ulceration, and, possibly, carcinoma, we see the direct effects of pathogenic bacteria or protozoa. In either case, in that of systemic or that of local infection, the malady is due to the action of poisonous products which the parasite has elaborated at the expense of the tissue in which it is lodged. These chemical substances, of definite though often complicated composition, act as direct irritants to the skin, whether originally deposited in or upon that tissue or brought to it by the blood. In their effects upon the skin, therefore, they may be compared to the action of those drugs which have the power of exciting eruptions when applied to the integument, or when ingested. The pathogenic bacteria or protozoa, may also, by their presence and development in the tissues, cause more or less mechanical or biological irritation or stimulation, and excite cell growth in this way.

In those cutaneous disorders attended by the formation of pus the pyogenic bacteria may be detected in the lesions. Three distinct organisms have been recognized as the most frequent exciting causes of suppuration, viz., the staphylococcus pyogenes aureus, the staphylococcus pyogenes albus, and the streptococcus pyogenes. Of these, the first-named has been most frequently found. This appears in the form of small, roundish cells which are so aggregated as to bear a resemblance to a bunch of grapes, and hence the name bestowed upon it, ςταφυλή, (from a bunch of grapes). Sporulation has never been observed in this species, which thrives at the ordinary temperature of living-rooms. When cultivated it produces an orange-yellow color. The staphylococcus albus differs only from the foregoing species in not producing the yellow pigment. It appears, likewise, to be somewhat less virulent in its action. The streptococcus pyogenes, though sometimes associated with staphylococci, is more frequently observed alone in purulent collections. It cannot satisfactorily be distinguished either in form or behavior from the streptococcus of erysipelas described by Fehleisen. Certain or all of these micro-organisms have been discovered in the lesions of impetigo, furuncle, carbuncle, and abscess. Professor Leloir has suggested that the ulceration of lupous nodules is due to the activity of pyogenic bacteria, though the tubercle itself depends upon the presence of the tubercle bacillus. The pustules of variola contain the ordinary microbes of suppuration, though the specific exciting cause of the eruptive fever has not yet been isolated; unless further investigations shall confirm the report of Councilman, that it is a micrococcus. Anthrax, or malignant pustule, depends upon the growth of a specific bacillus of marked infective properties. Fehleisen has demonstrated that the specific cause of erysipelas is a streptococcus developing in the form of small, globular cells which manifest a decided tendency to link themselves together and produce the appearance of extended chains. This characteristic arrangement is perceived when the organism is studied either in artificial cultures or diseased tissues. Gibier asserts that he has detected specific parasites in the lesions of pemphigus and hydroa. Pityriasis rubra is probably of microphytic origin, though an organism has not yet been isolated. Owing to the presence of the bacillus tuberculosis in the nodules of some cases of lupus, that disease is now often looked upon as a chronic form of tuberculosis. Though its clinical manifestations differ in decided respects from other forms of cutaneous tuberculosis, yet the present tendency is to consider the several varieties as falling under one and the same category. A fuller discussion of this subject will be given in connection with the account of the pathology and etiology of lupus in the body of this work. Leprosy has been proved to depend upon the activity of a certain bacillus, which is described with sufficient detail for the purposes of this book in the section on leprosy.

That syphilitic infection is due to bacterial agency appears to be in entire accordance with the nature and course of the disease. The organism has been recognized as a variety of spirillum, and has had various names, such as the Spirocheta pallida, the Treponema pallida of Schaudinn. Many facts in its natural history suggest that cancer should be classed among the diseases of parasitic origin. The investigations of Darier relative to the pathogenesis of Paget's disease of the nipple, those of Albarran, Wickham, Cornil, and others respecting carcinoma, render it probable that, at least in some cases, the multiplication and activity of protozoa give rise to carcinomatous formations. The lesions of molluscum epitheliale, likewise, have been thought to depend upon the same exciting cause. The interpretation of these observations has been denied by Török, Piffard, and other writers. From a study of the effect of polarized light upon the supposed protozoa, Piffard has concluded that, as regards molluscum epitheliale, and probably the other affections, the supposed protozoa are merely rete cells undergoing a species of horny degeneration. The occurrence of a micro-organism in the newly formed tissue of rhinoscleroma was first announced by Frisch and subsequently confirmed by other authorities, though it still remains uncertain whether the microbe should be regarded as the specific exciting cause of the disease. Some forms of eczema seem to depend upon the development of bacteria, while bacilli and micrococci have been found by several observers in the blood of subjects suffering from purpura. The skin, under ordinary circumstances, usually carries upon its surface a number of air-borne bacteria, many of which are pathogenic, especially staphylococci, streptococci, colon bacilli, tubercle bacilli, etc. This renders sterilization of the hands necessary previous to surgical operations.

## ETIOLOGY.

Diseases of the skin are produced by a variety of causes. A great number are secondary to morbid changes or functional disturbances in other organs or tissues, but many are the result of processes affecting the skin alone. The former are termed symptomatic or sympathetic affections, and are illustrated by urticaria, erythema nodosum, and the various diabetic, rheumatic and gouty exanthemata. The latter are known as idiopathic diseases, and may be produced by either internal or external causes. They are typically represented by the erythemas of heat and cold, and a number of the local hypertrophies. The relation between the skin and the other organs of the body is so intimate, however, that the distinction between these two classes cannot always be made. In some cases the local causes predominate, but in others the constitutional changes are the most important. A correct appreciation of the etiological value of each can be obtained only by a comprehensive review of the origin and development of the eruption.

The causes concerned in the production of diseases of the skin may be conveniently divided into predisposing and exciting.

### Predisposing Causes.

The predisposing causes are those which produce certain alterations or conditions of the general system or the cutaneous surface, by which the individual liability to the development of certain diseases is increased. They do not produce disease, but render liability to it greater. The most important of the predisposing causes of cutaneous diseases are age, sex, diathesis, occupation, seasons, climate, plethora, debility, unhygienic living, and heredity.

**Age.**—Many cutaneous diseases occur only during certain periods of life. Thus, tinea versicolor is a disease of adult age, while tinea tonsurans is more common in childhood. Ichthyosis, sclerema neonatorum, and the congenital syphilodermata appear at birth, or within a short time afterward. Strophulus is an affection of the first week of infantile life. Erythema, urticaria, and eczema capitis are frequently observed during dentition. Acne, seborrhea, and psoriasis rarely appear before the age of puberty. Carcinoma, epithelioma, and the majority of cases of pruritus are maladies of advanced life. Impetigo and intertrigo are affections of early childhood. Rhinoscleroma, morphea, scleroderma, and acne rosacea are diseases of adult age.

**Sex.**—Some cutaneous diseases occur more frequently, or exclusively, in the male sex, while others are more often observed in females. Sycosis, for instance, is found only in man. Chloasma and lupus erythematosus occur more frequency in woman; epithelioma and herpes in man.

**Diathesis.**—Psoriasis, eczema, and erythema nodosum can frequently be traced to a rheumatic or a gouty diathesis. Persons of a lymphatic temperament are liable to recurrent attacks of intertrigo, impetigo, and pustular acne and eczema. Eczema, lupus, and scrofuloderma are common in those of a strumous diathesis.

**Occupation.**—Various occupations are prolific predisposing causes of cutaneous diseases. Stone-cutters, shoemakers, carpenters, machinists, and other artisans, present more or less hypertrophy of the palmar epidermis. Blacksmiths, cooks, bricklayers, and firemen are frequent sufferers from erythema, eczema, and dermatitis. Fissured eczema of the hands from the use of strong soaps is often observed among washer-women. Eczema of the hands is very common among bartenders. Plasterers and stone-masons are also subject to the same affection. Hackmen are particularly prone to suffer from rosacea. Confectioners are liable to a form of onychia produced by the action of sugar, acids, and heat. Eczema occurs in grocers and sugar warehousemen from handling raw sugar which generally contains an acarus closely resembling the acarus scabiei. Butchers, tanners, and wool-sorters are liable to ecthyma and anthrax. Workers in aniline manufactories, oil-refineries, and tar-distilleries are often attacked by violent dermatitis.

**Seasons.** — Many cutaneous diseases occur more frequently or are aggravated in intensity during particular seasons of the year. Intertrigo and miliaria are rarely encountered except in warm weather. Rhus poisoning occurs in summer. Erythema multiforme and furuncles are more frequently observed in the spring and autumn months. Pruritus is usually most severe in the winter. Eczema and psoriasis have been frequently noticed to disappear in summer, only to reappear with the first week of cold weather. Seborrhea and ichthyosis are also worse during the winter.

**Climate.**—The influences exerted by climate in the development of cutaneous diseases is analogous to that of the various seasons of the year. Some diseases are peculiar to cold climates, others occur more frequently in the temperate zone, and some are almost exclusively limited to the tropical regions. The relative dryness or humidity of the atmosphere is also an important factor, and the clothing, diet, hygiene, and habits of the people in the different climatic regions must also be taken into consideration as exercising more or less influence upon the origin and progress of the prevalent diseases.

**Plethora.**—Plethoric patients are peculiarly liable to be attacked by the superficial inflammations of the skin. Intertrigo, erythema, and eczema develop in them upon the slightest cause, or frequently without any apparent cause, and in many cases prove rebellious to treatment. Pruritus and hyperidrosis are also observed in this class of patients.

**Debility.**—Debility is the essential predisposing cause of a great number of skin diseases. Impetigo, ecthyma, and pemphigus rarely occur except in the weak and ill-nourished. Furuncles and carbuncles are generally more severe in the debilitated than the robust. Seborrhea and comedo also usually accompany a weak and relaxed condition of the system.

**Heredity.**—Heredity exercises an important influence in the production of many cutaneous diseases. The peculiar liability of some persons to be attacked by a variety of skin diseases, while enjoying good health in every other respect, can be most satisfactorily explained by the supposition that they inherited a weak or susceptible skin. Among the diseases which are directly transmitted from parents to children are scrofula, syphilis, leprosy, and ichthyosis. Psoriasis and eczema frequently appear to be hereditary also.

## EXCITING CAUSES.

The exciting causes of diseases of the skin are those which directly or indirectly produce the disease. They may be divided into internal and external.

### INTERNAL EXCITING CAUSES.

The internal exciting causes are those that act from within the body. They are varied and numerous, and at times are so obscure as to escape recognition. They may be seated in the affected portion of the surface, but more frequently they are to be found in disorders of distant organs and tissues, or in derangements of the general system. The most prominent of the internal causes of diseases of the skin are the systemic disturbances produced by pregnancy, dentition, vaccination, and certain medicinal substances; dietetic errors, neurotic disturbances, constitutional diseases, and disorders of internal organs.

**Pregnancy.**—Many women suffer during the latter months of pregnancy from herpes, eczema, or pruritus, for which no other cause can be observed than the physiological alterations which occur at that period in the blood and other tissues. Patches of chloasma are also frequently developed at the same time. The treatment in these cases should be merely palliative in character, as all the symptoms usually disappear spontaneously as soon as the pregnancy is ended.

It is a curious fact that psoriasis and other chronic affections frequently disappear during pregnancy, or are lessened in extent and severity. Lactation also exerts considerable influence on the progress of psoriasis, eczema, acne, and other disorders of the sebaceous glands. In some instances these affections are aggravated by lactation, but in the great majority of cases during this period marked improvement is perceptible.

**Dentition.**—The systemic irritation produced by dentition is frequently the only observable cause of urticaria, erythema, eczema capitis, and other cutaneous diseases, but its importance must not be exaggerated. Close investigation will often result in the discovery of concomitant and more important disorders.

**Vaccination.**—Vaccination is occasionally followed by extensive erythematous or inflammatory eruptions. They are usually benign in character, and disappear in a few days. Sometimes, however, owing to the use of impure lymph, or to the depraved state of the patient's constitution, deep-seated erysipelatous inflammation, or cellulitis, may be developed, and run a tedious course, during which much destruction of tissue may occur.

**Medicines.**—Various cutaneous disorders have been observed to follow the use of certain medicinal substances. An obstinate form of acne is produced by the prolonged administration of either the bromide or iodide of potash. Antipyrin, copaiba, cubeb, and santonine frequently give rise to an urticarial eruption. Turpentine, quinine, chloral, opium, and belladonna sometimes produce an extensive erythema resembling the eruption of scarlet fever.

**Dietetic Errors.**—A great number of cutaneous diseases are produced by errors of diet. In some cases the food habitually partaken of is too rich or too highly seasoned; in others it is too poor in quality and insufficient in quantity. In many persons cutaneous eruptions are invariably produced by special articles of food. Urticaria is frequently developed after a meal during which fish, oysters, or strawberries have been eaten. Urticaria may also be produced by raspberries. Obstinate pruritus, erythema, and eczema are known to be frequently due to a diet of oatmeal buckwheat. Acne and urticaria are often produced or aggravated by cheese, pastry, ale, and beer. Similar affections may be caused by constipation and consequent auto-intoxication. In this connection it may be noted that a warm-water enema will occasionally give rise to a scarlatiniform rash.

**Neurotic Disturbances.**—Neurotic disturbances are the principal factors in the production of a great many cutaneous diseases. In some cases the morbid process is seated in the central nervous system, but in others it involves only the peripheral terminations of the nerves to the affected part. Prominent among the affections which are due to disturbances of innervation are urticaria, herpes zoster, dermatalgia, pruritus, and a number of hypertrophies, atrophies, and new formations. As indicative of the nervous origin of a skin disease, Mr. Jonathan Hutchinson points to the corymbiform or branched disposition of the lesions as corresponding to the distribution of cutaneous nerve-fibrils. Moreover, a neurotic affection does not propagate itself by direct extension or infection of adjacent parts, and the malady likewise develops itself fully in the first instance. Erythema, eczema, pemphigus, ecthyma, scleroderma, vitiligo, and other affections may also be the result of alterations of the nervous system. From the same cause the glands and the appendages of the skin may become diseased. Hyperidrosis, anidrosis, grayness, baldness, and loss or deformity of the nails not infrequently depend upon lesion of some portion of the nervous system. Functional nervous disorders, reflex excitation, and strong emotion often occasion eruptions upon the skin. Under the title of "geromorphism," A. Souques and J. B. Charcot have described a case, beginning after severe fright, in which a series of papules appeared and in a few weeks rendered the countenance unrecognizable. Ten years later, at the age of twenty-one, the patient looked like an old woman.

**Constitutional Diseases.**—Among constitutional diseases which produce cutaneous disorders are pyemia, syphilis, scrofula, scurvy, malaria, chlorosis, Addison's disease, and the exanthemata. Gonorrhea may occasion an eruption resembling that of measles or scarlatina; various forms of septic infection may be attended by furuncles, urticaria, erythema nodosum, hemorrhagic and bullous eruptions.

**Disturbances of Internal Organs.**—Functional and organic disturbances of internal organs are the exciting causes of a number of eruptions. Pruritus and eczema are frequently due to cardiac degeneration or valvular disease. Diabetes is a cause of pruritus and furuncles. Acne, eczema, and urticaria often depend upon some genito-urinary disorder. Bright's disease and other affections of the kidneys are frequently exciting causes of erythema and eczema. Pityriasis rubra, lichen, and purpura occur in the subjects of renal disease. Uridrosis results from suppression of the urinary secretion. An eruption of bright red, itching macules and papules, followed by desquamation, incrustation, or suppuration, has been witnessed in the latter stage of chronic interstitial nephritis. Acne, eczema, and erythema nodosum are produced by disorders of the liver. The menstrual periods are sometimes marked by erythema or other eruption. Derangements of the alimentary canal are the most frequent causes of all cutaneous diseases of an erythematous or inflammatory type. The external exciting causes of diseases of the skin are varied and numerous. The most important are improper clothing, extremes of heat and cold, mechanical and chemical irritants, personal habits, scratching, parasites, and contagion.

**Improper Clothing.**—Improper clothing is a common cause of cutaneous diseases. Erythema, eczema, pruritus, and miliaria are developed, in some persons, by the use of flannel underclothing. Colored stockings and hat bands (dyed with aniline containing arsenic) produce severe cutaneous inflammations. Silk underwear has been known to set up a dermatisis. Tight garters may give rise to varicose ulcer, chilblains, or eczema. Irritation of corsets, or underclothing, may induce circumscribed scleroderma. According to Hutchinson, the irritation of a new woolen vest may bring out an eruption in a syphilitic subject. A non-specific eruption resembling syphilis may be produced by like cause. Dr. Hobien has investigated the receptivity of various kinds of underwear for micro-organisms. These bodies are caught in the interstices of the cloth or adhere to its surface. The looser the woof the more readily are microbes retained. Smooth and fine woven linen and cotton materials retain fewer organisms and can be most thoroughly sterilized by boiling. Under ordinary circumstances the germs do not develop and multiply in the clothing.[1]

**Heat and Cold.**—Heat and cold are also important factors in the production of cutaneous diseases. Exposure to intense heat, whether artificial or that of the sun, is a frequent cause of erythema, dermatitis, eczema, and miliaria. A variety of fissured eczema, ordinarily known as "chapping of the hands," is a common result of exposure to cold. If the cold be intense it may be followed by the development of so-called frost-bite or chilblains, or the death of the exposed part.

**Mechanical and Chemical Irritants.**—Many cutaneous diseases are the result of mechanical irritation. Tight shoes or stockings produce corns, and various excoriations or ulcerations of the feet. Tight garters often give rise to an eczematous condition of the lower extremities. Extensive erythemas and eczemas are sometimes caused by coarse or ill-fitting underclothing. Various callosities and other hypertrophies are developed in carpenters, stone-cutters, shoemakers, and other artisans, by the pressure and friction to which certain portions of the integument are constantly subjected during working-hours. Intertrigo is produced and aggravated by the pressure and friction of the apposing surfaces.

Chemical irritation is a more frequent and more serious cause of cutaneous diseases. Severe inflammations may result from the use of arsenical cosmetics or depilatories. Artificial-flower makers, manufacturers of wall-paper, and workers in acids, alkalies, aniline dyes, and other chemcals, are subject to various eruptions which are the result of the irritating action of these materials on the skin. Bakers and workmen in sugar refineries are subject to eczema of the fingers and hands, spinners to eczema and a peculiar form of dermatitis. Dr. Paul Fabre, in his studies of diseases of miners, describes, among others, miliary eruptions, erythema, furuncles, and prurigo.[1] Dermatitis of the legs is not infrequently produced by colored stockings. Sweating of the feet may be caused by imperfectly tanned leather in the soles, which undergoes putrefactive changes under the effects of heat and moisture. Hemlock tanning is said to be irritating to tender skin, when shoes of this kind are worn. Children's shoes particularly should be well made and of good material.

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[1] "Weekly Medical Review," February 28, 1891.

Severe cutaneous inflammation may also be caused by the incautious application of any of the ordinary rubefacients or epispastics, or by contact with various poisonous plants. Various eruptions may likewise result from the external use of turpentine, croton oil, or arnica, or the sulphur and mercurial preparations.

**Personal Habits.**—The habits of the individual are often important factors in the production of cutaneous diseases. Eczema and acne rosacea are frequently the result of alcoholic indulgence. Acne may be due to excessive smoking and neglect of the bowels. Personal uncleanliness is also a cause of cutaneous disease in some cases; but, on the other hand, too much attention may be given to cleanliness, and the integument injured by the frequent use of strong alkaline or highly-scented soaps.

**Scratching.**—Many cutaneous lesions are directly produced, and all pre-existing eruptions are intensified, by scratching. In urticaria it increases the size and number of the wheals, and in eczema it augments the inflammation and exudation. Scabies, prurigo, and pediculosis are increased in severity by it, and an insignificant pruritus may be converted by it into an extensive inflammatory disease. In protracted cases it may produce considerable pigmentation and thickening of the skin. Parasitic diseases may be spread by it, or simple lesions become infected.

**Parasites.**—A number of cutaneous diseases are produced by animal and vegetable parasites. The hair and nails also suffer from their ravages. Those organisms which are the best known and most common exciting causes of disease of the integument have been enumerated on page 54 under the section upon general Pathology. They need not, therefore, be repeated in this place. Numerous microphytes are constantly present upon the general surface. Of these, some species are probably incapable of thriving upon the human skin; others are pathogenic under favorable circumstances. When the proper conditions are lacking they are unable to multiply, and remain innocuous.

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[1] Le Progrès Médical, June 15, 1889.

**Contagion.**—Contagion is a prolific source of cutaneous diseases. Impetigo contagiosa, small-pox, measles, scarlet fever, equinia, and erysipelas are frequently communicated by direct contact. Many of the cutaneous lesions of syphilis are contagious; likewise the external parasitic diseases; but some are more readily transmitted than others. Individual susceptibility is an important factor in the propagation of all diseases of this nature. Some persons are readily affected by the poisonous germs or spores, while others may be exposed to them with impunity. Many diseases of the skin are brought to this country by immigrants, skin diseases being much more prevalent in Europe than in the United States. Cases of parasitic disorders are readily contracted on shipboard. To prevent the spread of these the persons and clothing should be scrupulously cleansed and sterilized by heat, upon arrival. Diseases of uncommon occurrence in this country are also not infrequently imported.

**The Opsonic Index.**—Dr. A. Edward Wright, an English pathologist, recently found an element in the blood which aided the phagocytes in destroying pathogenic microbes. He discovered that the leucocytes could not perform their work as phagocytes unless stimulated by a certain substance which he recognized in the blood-serum. This substance acts upon the foreign organisms so as to render them more easily overcome by the white blood-cells. To this substance he gave the name of opsonin (from the Greek word οψωνέω, to prepare food). It is probable that several different kinds of opsonins exist to give resisting power to the human body against infection of different kinds. When the opsonins are deficient the body becomes more vulnerable to disease. The opsonic index is an expression in figures of the proportion of the opsonins in the blood, as regards a certain disease, such as tuberculosis or diphtheria. It may be greater or less than the normal standard which is determined by experiment. This discovery has been utilized for diagnostic purposes, by the introduction of so-called "opsonic vaccines."

It is evident that when the resisting power of the organism is below the normal standard, there is increased susceptibility to infection, and this applies to the skin as well as to any other organ, or tissue, of the body which is liable to be attacked by disease. A low opsonic index means greater susceptibility; a high opsonic index means relative immunity.

The determination of the opsonic index has been taken up by a number of American observers with considerable enthusiasm, and in the main the claims of Wright have been confirmed. The technique, however, is decidedly difficult, and requires the skilled expert in order to carry it out properly. Good results have been reported from the opsonic treatment of acne pustulosa, and sycosis.

# TREATMENT.

THE adaptation of the proper treatment to diseases of the skin requires on the part of the physician a thorough knowledge of general medicine. The previous history, including any idiosyncrasies which the patient may have, the present constitutional and local conditions, the nature of the affection and its cause or causes, if they can be ascertained, should all be looked into from the standpoint of general medicine, and rational deductions drawn from these considerations as to the proper method of treatment. As a rule, the deductions, after careful inquiry into all the circumstances just briefly recounted, will lead the physician, in the majority of cases, to employ both constitutional and local remedies. The most decided, rapid, and certain results are generally obtained from constitutional treatment, which greatly assists the action of the topical remedies which may be employed. In some affection it alone may be demanded, or simple local treatment will suffice, while in still others it becomes necessary to employ both at the same time. Again, constitutional and local treatment in conjunction may be necessary at one stage of the disease, and should only be used singly at another. Further, the remedy or remedies employed, whether for systemic or local action, may be proper at one period and useless or harmful at another. Great care must, therefore, be exercised to be able to know from a general knowledge of medicine and the effects of different local applications, just what to do at the proper time in a given case of disease of the skin.

## CONSTITUTIONAL TREATMENT.

The general health should be carefully examined, and, if impaired or deranged in the least, should be corrected by suitable constitutional treatment. It may be necessary to administer acids, or one of the various tonics, or alkalies—particularly the natural alkaline waters—alteratives, anodynes, or hypnotics, or various other remedies, in order to make a thorough impression and relieve or cure the eruption. It often becomes necessary likewise to use diaphoretics, or to increase the action of eliminative organs of the body by the employment of aperients, cathartics, and diuretics, particularly in inflammatory diseases in which there may be imperfect or defective secretion and excretion. The principal means employed may be referred to as follows:—

**Hygiene.**[1]—The observance of the commonly accepted hygienic laws in diseases of the skin is all-important, especially after the eruption has fully developed, or has become chronic. The first and most essential measures which should receive attention are ventilation and bathing. The latter will be found in some acute affections to be contra-indicated, while in others, especially those of a subacute or chronic nature, it may be followed by the most happy effect. Dress for all parts of the body, but more particularly for those which come in contact with the affected surface, requires to be adapted to the needs of the case under consideration.

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[1] See also paper by author on "Hygiene of the Skin in Health and Disease," in Journal of Cutaneous and Genito-Urinary Diseases, 1889, vol. vi, pp. 373 and 416.

Clothing has an influence upon the health of the integument. That worn during the day should be entirely removed before retiring to rest at night, and each piece hung up separately, in order that the absorbed perspiration may evaporate and the garments be ventilated. Cutaneous disease, as already intimated, is apt to be occasioned by dyed hosiery or underwear.

Next in importance to dress are rest and exercise, the former being very frequently necessary in some of the inflammatory diseases, especially in their beginning, and the latter, judiciously and properly used in later stages, or in the chronic forms. Out-door exercise, with plenty of good fresh air and sunlight, should be taken, if possible; or, if not, passive exercise, or massage, may be resorted to, if necessary. A suitable change of climate will often in some of the more obstinate diseases, especially those due to impairment of the nervous system, be followed by beneficial results.

Climate has an undoubted influence upon the well-being of the skin, as it also has in causing certain diseases. The customary temperature of the atmosphere, joined with the modifications of dress, diet, and general habits of life which it creates, establish a predisposition to certain forms of disease. The skin certainly requires somewhat different treatment, both in health and disease, according to whether the climate be cold and dry or moist and warm.

The health of the scalp and hair is promoted by the use, in winter, of soft hats pierced with numerous holes or, in summer, of light straw hats of open structure. Heavy or stiff hats obstruct the circulation in the scalp.

Sleep is also a hygienic measure which concerns the skin no less than the nerve-centres. Cheerfulness should be cultivated, since cutaneous disturbances of sensibility or of circulation are often the outcome of long-continued mental strain. Frequent ablutions are necessary to the health and beauty of the skin.

**Diet.**—Attention to diet is often more important than the administration of remedies. The quality and quantity of the food must be regulated according to the disease and the condition of the patient. A diet restricted to certain articles of food may be demanded, or a special dietetic course be necessary. Each case requires to be carefully looked into by the physician, and the amount and character of food[1] regulated as may seem suitable and judicious. Imperfect digestion is, either directly or indirectly, an important factor in the etiology of many diseases of the skin. The nutritive condition of the skin is, indeed, to a great extent, an index to that of the organism generally, and a characteristic appearance of the integument is produced by any grave perversion of general nutrition, such, for instance, as chlorosis, amyloid degeneration, chronic malaria, leukemia, jaundice, Addison's disease, purpura, scurvy, cancer, or pyemia. Cutaneous maladies are common in scrofula and diabetes mellitus. In syphilis and the exanthemata a diagnostic importance attaches to the cutaneous lesions. A less severe systemic intoxication results from the retention in the blood of excrementitious products, the results of faulty elaboration of food. When these are produced in excess the excretory glands are unable to eliminate them completely, and their presence excites disease in various organs and tissues, including the skin. The secerning glands eventually become involved, when diminished elimination adds to the effect of increased production. The habitual ingestion of excessive quantities of nitrogenous food and the constant consumption of alcoholic beverages are productive of many disorders of the integument. Functional or organic disease of the stomach, liver, pancreas, or intestinal mucous membrane generates a host of cutaneous maladies. The imperfect digestion of starchy and fatty substances leads to consequences scarcely less deleterious. There appears to be no direct relation between particular affections of the alimentary canal and disease of the skin notwithstanding the fact that many of the latter appear under modified forms upon the mucous membrane of the gastro-intestinal tract. Catarrh of the stomach or bowel is not necessarily represented upon the skin by eczema, but may give rise to urticaria or other lesion. Constipation may cause redness of the nose and acne.

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[1] See paper by author on "Food in Health and Disease," The Medical Bulletin, January, 1891.

The beneficial effect of an appropriate and regulated diet upon diseases of the skin is not always justly appreciated. Unless the general health is obviously impaired, close inquiry concerning the state of the digestive functions is apt to be neglected. Great care should be enjoined as to the use of articles which, like animal food, may embarrass the liver or those which, like fatty, amylaceous, or saccharine materials, readily undergo fermentative changes in the alimentary canal. Alcoholic liquors, as a rule, should be forbidden. In the lithic-acid diathesis a highly nitrogenized diet is inadvisable. In acute eczema, especially when a large extent of surface is involved and when the patient is young, the condition may approach, in severity and constitutional reaction, that of an essential fever. In this case a bland, unirritating, and easily digestible diet is indicated, such as milk, milk toast, boiled or baked potatoes, tapioca, arrowroot, etc. When eczema occurs in a gouty subject, meats should be sparingly given and alcohol prohibited. The diet should be composed chiefly of vegetables and fruit with bread and butter. In rheumatic eczema, acid articles and those which readily undergo fermentation should be eliminated as far as possible from the food. A scrofulous patient requires liberal sustenance.

Fat in some form or other should be as freely supplied as the state of the digestive organs and power of assimilation will permit. Meat (except the more indigestible kinds, as veal), soups, broths, eggs, custards, milk, and vegetables should form the dietary. I regard codliver oil, so universally given in any scrofulous manifestation, as a true food, and it is noteworthy that strumous patients, even children, will often take the oil without repugnance. Milk is doubtless the most general pabulum in all the protean varieties of eczema. Unfortunately, however, patients will often tire of a rigidly monotonous milk diet. We may frequently, however, vary the regimen by the use of puddings prepared with milk, as bread, apple, or tapioca pudding, custard, or by ice cream. When eczema is produced by diabetes mellitus, it is evident that its relief must depend upon the success of our treatment, chiefly dietetic, of the underlying condition. Affections of the glandular system of the skin generally require food of a supporting character as an important adjunct in their treatment. Their internal medication often resolves itself into the effort to improve digestion and assimilation. In seborrhea the food must be sufficient, nutritious, and digestible. Beef, mutton, eggs, poultry, rabbit, soups, pigeon, sweetbread, venison, oysters, fresh fish, and the more digestible vegetables are especially valuable. The subjects of acne generally present evidences of impaired nutrition in the form of anemia, chlorosis, general debility induced by genital defects, or suffer from some constitutional taint, notably scrofula. The dietary in this disease should be constructed upon the same plan as that already outlined for seborrhea. Hyperidrosis and anidrosis usually occur in debilitated individuals, whose diet, therefore, should be of a supporting nature. Rosacea generally depends upon long-continued irritation of the walls of minute blood-vessels by waste products, the result of incomplete digestion or upon the presence of alcohol in the blood. The food should therefore be simple and substantial, and alcoholic beverages should, in most cases, be interdicted. In purpura, which is preceded or accompanied by considerable or even grave prostration, an abundant supply of nutrient material, such as milk, soups, broths, and oysters, is demanded. Lichen planus is often due to impaired digestion, and recovery is accellerated by a liberal diet, consisting of animal food, eggs, milk, poultry, fruit, and vegetables. Lichen ruber is benefited by a similar regimen. Herpes zoster calls for an abundant supply of fatty articles of food, as milk, cream, butter, eggs, animal fats, vegetable oils, cocoa, etc., not forgetting codliver oil. In pemphigus and hydroa the food should be composed of soups, poultry, the more digestible meats and vegetables, eggs, and milk. Nutritious food should be an essential part of any plan of treatment in sycosis. In the pustular affections, impetigo, impetigo contagiosa, and ecthyma the diet should be constructed upon the same plan as that recommended for pemphigus. Pityriasis rubra demands vigorous alimentation. The digestible meats, the fat as well as the lean, strong soups, milk, cream, eggs, and vegetables should be given as freely as the digestive powers of the patient will admit. If furuncles occur in the course of diabetes mellitus, the regimen suitable to that disease is required; if in a rheumatic, gouty, scrofulous, or tuberculous condition of the system, the diet should be arranged in reference to the underlying diathesis. Boils may also be the expression of malnutrition arising from dyspepsia, in which case a selection of foods should be made in accordance with the form which the indigestion assumes. The necessity of a generous diet is even more urgent in carbuncle, which calls imperatively for animal broths, with the addition, as a rule, of alcoholic stimulation. Alimentary principles are demanded in the management of the hypertrophic skin diseases. In psoriasis, much depends upon attention to the gastro-intestinal tract, and the effect of any medicinal measures is greatly enhanced when digestive failures are first corrected. In recent cases it is wise to limit the quantity of nitrogenous substances consumed, and depend for support rather upon the carbohydrates, supplemented by cream and butter, fruits, and vegetables. Ichthyosis is essentially incurable, but in addition to local treatment, which is our main dependence, it seems advisable that the diet should be rich in fats, in the hope of aiding the nutritive effects of the unguents applied externally. Scleroderma may also be favorably modified by the use of fatty articles of food. Regulation of diet should enter into our treatment of alopecia, especially of alopecia circumscripta. In scrofuloderma, lupus erythematosus, and lupus vulgaris the food should consist of the substances already mentioned as appropriate to eczema. Even in such fatal diseases as lepra, epithelioma, and sarcoma the use of suitable food is not entirely without therapeutic effect. In lepra, the diet should be bland and nutritious; in epithelioma and in sarcoma bread, milk, eggs, vegetables, and fruits may be allowed; but it is advisable to limit the consumption of animal food. In the more severe forms of the exanthemata, so great is the febrile reaction that gastric intolerance is a prominent symptom. Milk, or milk and lime-water, is often all that will be borne. Fortunately, in scarlatina the fever is of brief duration, and in view of the frequent occurrence of nephritis as a sequela, no article is better adapted to the disease than milk. After the subsidence of the fever, however, beef soup, mutton broth, or milk toast may be added. Rubeola and rötheln generally require less scrupulous attention, but in malignant or black measles the same sustaining diet is necessary as in any other virulent specific fever. Confluent and malignant small-pox demand systematic nourishment from the beginning of the attack. In erysipelas, vitality must be supported by the same nutritious and assimilable diet demanded in variola, typhoid and typhus fevers, and diphtheria. The neuroses of the skin are not infrequently due to chronic indigestion. Whatever may be the origin, it is nearly always of such a nature as to indicate a generous diet, rich in fatty foods.

In diseases of the skin, alimentation is, therefore, but another mode of medication. The mineral substances contained in foods are identical with those demanded for the composition of the blood and tissues. As far as they are absorbed from the food, to that extent are drugs to be looked upon as merely supplementary.

In the treatment of diseases of the skin the following classes of drugs have been found to be especially beneficial:—

**Hematics and Hematinics.**—Hematics, also known as blood-tonics, include all remedies which are administered to improve the composition of the blood. Hematinics are those which increase the actual number of the red blood-corpuscles, and also increase the proportion of hemoglobin, when it is below the normal. Among the principal agents of this class, which have been found to be useful in treating diseases of the skin, are iron and its preparations, and manganese. Certain animal extracts, juices, and especially organic secretions, have a similar effect. Also some articles of diet, already referred to, and hygienic measures might be included in this class.

**Oils and Fats.**—The oils and fats of vegetable, mineral, and animal origin are generally nutritious, and, in large quantities, laxative or purgative. They can be used with advantage internally in many diseases attended by poverty of the blood, and with a torpid action of the liver and bowels. Animal oils, generally speaking, such as codliver oil and lard, when used internally or applied externally, have more affinity for the human tissues, and are, therefore, as the rule, better borne by the digestive organs and system than either the vegetable or mineral oils. The vegetable oils, however, are more largely employed. Olive oil, commonly known as sweet or salad oil, in conditions of malnutrition, is an excellent tonic; it promotes peristalsis and general nutrition. Linseed, or flaxseed oil, when fresh, may be used for the same purposes as olive oil. The oil of maize may similarly be utilized, although thus far not much use has been made of it in medicine.

The oils and fats employed locally in the treatment of cutaneous diseases,[1] are classed as (1) bland, or (2) stimulating. Among the former the principal ones are codliver oil, olive oil, linseed oil, sweet almond oil, corn oil, cottonseed oil, and petrolatum, lard, purified wool-fat, and spermaceti. These are valuable for softening and removing scales, crusts, and extraneous matter from the surface. They are also useful for protecting and soothing the inflamed skin in the eruptive fevers. The second or stimulating class of oils and fats are particularly serviceable in many affections of the skin. The principal members are the group of tar oils, as the oil of cade, the oil of juniper, and the rectified oil of turpentine. The oil of croton seeds is especially irritating, and when used pure excites a pustular eruption, which is sometimes useful as a counter-irritant. The oil of ergot and chlorinated olive oil are also examples of this class of stimulating applications. Chlorinated oil, as I have demonstrated, often acts well in animal parasitic diseases, especially for scabies. The oil of ergot is also a valuable agent in seborrhea of the scalp with loss of hair. The hydropathic employment of the oil of pine in a vapor-bath is often very effective in old eczemas and in psoriasis. Oleum ricini, or castor oil, is a suitable menstruum for external remedies, when it is desired to retain drugs in contact with the surface. Castor oil, for children or infants suffering with eczema and many inflammatory diseases of the skin, is a most valuable purgative and alterative. Liquid petrolatum is a bland mineral oil, which is used principally as a vehicle for external medication.

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[1] See paper by the author, "New Remedies in the Treatment of Ski
Transactions of the Medical Society of the State of Pennsylvania, vol.
p. 85.

**Codliver Oil.**—Codliver oil is both a good food and a valuable remedy in many diseases of the skin. It is the remedy above all to employ in those cases in which the health has become affected through faulty assimilation, notably in eczema, scrofuloderma, and in tertiary and congenital syphilis. It is also equally serviceable in many of the non-specific chronic forms of skin diseases. It may be administered in doses of from one fluid drachm to half an ounce, either alone or as an emulsion. A few drops of ether added to the dose, may overcome any unpleasant nausea from it, and will also assist its absorption from the intestinal tract. If the oil can neither be retained nor assimilated, it may be given hypodermically, one or two drachms being injected into the loose cellular tissue of the back. I have recommended and demonstrated the utility of employing it in this manner in scrofuloderma, paresthesia, and in many cutaneous diseases depending upon a lack of nutrition of the system.[1] If a large-sized hypodermic syringe (60 minims) be used, and the oil injected deeply into the cellular tissue, it usually disappears in from twelve to twenty-four hours, without producing any unfavorable result. That the oil is absorbed and assimilated when given in this way, can be demonstrated by injecting the same quantity of castor oil (its viscidity being first lessened with an equal amount of almond oil), and the result will generally be a satisfactory laxative movement of the bowels within one or two hours' time. Oils are also capable of being absorbed by the skin when applied to the general surface, especially if combined with gentle massage. This method is serviceable in leprosy, especially with chaulmoogra oil.

**Iron and its Preparations.**—The preparations of iron are invaluable in the treatment of a large number of skin diseases. They are indicated especially in all eruptions due to a depraved state of the system, such as eczema, psoriasis, sycosis, syphilis, and scrofula. The iodide of iron, in pill or the syrup, exercises, as a rule, a beneficial effect over pustular eczema, and in chronic cases of syphilis. Many cutaneous eruptions, which are clearly due to anemia and chlorosis, are thus favorably and promptly influenced by one or another of the preparations of iron. The tincture of the chloride in very large doses (one-half to two drachms every two or three hours), certainly assists in arresting the progress of facial erysipelas. Iron may be advantageously combined with strychnine, arsenic trioxide, quinine, and other remedies. It may be administered likewise alone, in the form of a natural chalybeate water. The modern combinations of iron with albumin are said to be less liable to cause constipation and headache than other iron preparations.

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[1] "The Treatment of Disease by the Hypodermic Injection of Oil." Read by the author before the Section of Practical Medicine, at [illegible] the American Medical Association, June, 1885.

**Manganese.**—Manganese exists in a small quantity in the blood and bile; it is always found in conjunction with iron. It is, therefore, a very valuable hematinic in many diseases of the skin depending upon changes in the blood. Manganese is very beneficial in all skin diseases arising from anemia and chlorosis. In secondary, tertiary, and quartenary syphilis it is most useful alone, or combined with iron and arsenic. In chronic eczema and psoriasis due to rheumatism, manganese alone, or given with other hematinics, is followed frequently with the very best results. It can be administered as the precipitated dioxide in a capsule or pill, the sulphate or the hypophosphite of manganese, or the permanganate of potassium in solution in water, in doses of from a fraction of a grain to two or more grains, three or four times a day.

**Animal Extracts, Secretions, and Serums.**—Many remedies of animal origin are now employed with great practical advantage in the treatment of diseases of the skin. They owe their activity in some cases to their very complete molecular structure, constituted principally by organic compounds of iron, iodine, phosphorus, nitrogen, etc.; in other instances they are the chemical products of bacterial activity (toxins, antitoxins), and in yet others to the internal secretions of certain glands and organs, which have been shown clinically to favorably modify nutrition in certain diseases. They prove of advantage in modifying the composition of the blood, or by supplying to it certain principles that are required by this vital fluid. These pharmaceutical preparations of animal origin can, therefore, be well classed among hematic remedies. Acting upon these views, Brown-Séquard reported that testicular fluid or extract had been administered with benefit in one hundred cases of cancer, its use being alleged to be followed by cessation of pain, hemorrhage, and progressive cicatrization of ulcers in nearly all of the cases. The best results from the use of animal extracts have been obtained from the thyroid extract in obesity, psoriasis, eczema, and syphilis. Care, however, must be exercised in the administration of thyroid extract, or the whole gland, as toxic effects or even fatal results have been reported from the too free administration of this agent. The dose of the thyroid extract usually is from one to five grains three times a day. It is administered in tablet form. The suprarenal extract, also given in doses of from one to five grains four times a day, is a good remedy in Addison's disease. The suprarenal extract or its active principle, adrenalin hydrochloride, internally and externally, lessens the pain of cancer. It increases blood-pressure, and is a valuable temporary heart stimulant. Adrenalin solution, 1 to 1000, produces immediate blanching, and a benumbed feeling on the mucous membrane to which it is applied. The solution just named is therefore of great value in all hemorrhages of the mucous membranes. It can also be effectively applied in much weaker solution upon a compress of absorbent cotton or gauze. Bone-marrow is another animal hematic remedy of great value, especially in many cutaneous diseases depending upon anemia. It may be administered in teaspoonful doses once or twice a day; usually it is spread upon, or between, slices of bread. In syphilis the serum of the lamb, the ox, and of the dog has been used with marked benefit. The blood-serum obtained from horses inoculated with erysipelas has been used as an injection in carcinoma. In the same way, a serum antidote to streptococcic infection has been injected in severe cases of erysipelas and in scarlatina. Coley, of New York, was among the first to use this serum, and he has successfully treated sarcoma with it. Diphtheritic lesions of the mucous membranes and skin are very quickly improved by the administration of diphtheria antitoxin.

**Alkalies.**—Alkalies combine with and neutralize acids, thus being useful in hyperacidity of the stomach when administered after meals. They stimulate the secretion of acid when given before meals, and overcome that of alkaline fluids. Alkalies given before a meal excite the flow of gastric juice and thus promote digestion. On the other hand, alkalies administered after meals, overcome acidity and therefore often thus relieve the symptoms of indigestion. Alkalies are beneficial not only in neutralizing acid secretions of the mouth and stomach, but likewise those of the bowel, vagina, and skin, and obviating the lesions that follow disorders of secretion frequently on the latter organ. In eczema, psoriasis, paresthesia, lichen, acne, and rosacea depending upon a hyperacidity of the secretions, the potassium and sodium salts, with vegetable acids, as the bicarbonate of potassium or sodium in from one to ten grains, three or four times a day, are most valuable. Acetate of potassium or sodium in from five to ten grains, three or four times a day, often has a decided alkaline and diuretic action upon the secretions. The salts of lithium, as the citrate, benzoate or salicylate, in from one to ten grains at a dose, every one or two hours, are valuable in gouty and rheumatic eczema and psoriasis. Potassium in the form of the iodide, given with other alkalies, assists in dissipating the infiltration of syphilis, and of psoriasis. Sodium, or ammonium salicylate is very useful in rheumatic affections of the skin and mucous membrane.

The alkalies, as weak solutions, alone or combined with glycerin or witch-hazel water are beneficial in paresthesia, and especially in lichen tropica or hyperidrosis. Alkaline solutions check the discharge of acute eczema, and often allay the itching, smarting, and burning in very many diseases of the skin. Lime water or bicarbonate of sodium, alone or combined, allay the burning pain of burns and scalds.

**Chlorate of Potassium.**—This powerful but valuable remedy is useful in the treatment of all diseases depending upon suboxidation or defective nutrition, secretion, excretion, aëration, and abnormal molecular metamorphosis. In small doses it increases the appetite, and in large or excessive doses it may, like any other potent but valuable remedy, produce an injurious or even poisonous action. Given in small or moderate doses, it is a most effective remedy for abating, and often promptly curing, many pustular diseases. It is especially beneficial in ecthyma of debilitated subjects. In boils, carbuncles, styes, pustular acne, impetiginoid eczema, and sycosis, it diminishes the tendency to suppuration, and, if the latter stage has been reached, will assist largely in arresting it. A happy effect from the drug will frequently be experienced from its employment in scrofulous subjects suffering with enlarged and suppurating glands, unhealthy ulcers, papules, pustules, and other lesions arising from this peculiar state of the system, and accompanied with more or less constitutional impairment. In many such typical cases, and some even less so, the continued use of the drug in moderate doses will tone up the digestive organs, increase the appetite, and lessen the formation of pus. It will, by thus adding tone and vigor to a previously weakened system, prepare the patient for the use of other measures, such as good nourishing food, exercise, fresh air, and perhaps tonics, all of which are so necessary for thoroughly eradicating scrofula. Purpuric, and broken-down, syphilitic patients are often benefited by chlorate of potassium. It will also increase the quantity of urine, and may be recovered from that secretion. The dose of the drug is usually from one-half to thirty grains, freely diluted with water, every three or four hours. The dose will have to be graded according to the condition of the patient; the pale, weak, and enfeebled bear much larger doses than the apparently vigorous. When given in too large doses the kidneys suffer with intense congestion owing to a deposit of crystals in the the tubules, and the blood is also chemically changed, an excess of methemoglobin being formed.

**Magnesium.**—Magnesium salts, and especially the carbonate, likewise are beneficial in the class of diseases just cited. Magnesium sulphate is especially useful, constitutionally, in warts and horns, given in ten grains to one or more drachms, three or four times a day.

**Calcium.**—Lime salts are known to be of especial benefit in the removal of many morbid conditions of the skin and of the glandular structures. In strumous and syphilitic subjects, the salts of lime are invaluable. Lime water is of great value in acute vesicular eczema, both externally and internally. In scarlatina and measles, calx sulphurata often lessens the fever. The same salt is invaluable in acne, furuncles and carbuncles. In purpura and in the severe forms of small-pox it possesses especial action in lessening the tendency to hemorrhage. It is given in from a fraction of a grain to five or more grains three or four times a day.

**Acids.**—Acids administered after meals furnish the necessary acid medium of the gastric juice, thus increasing the efficiency of the pepsin and gastric digestion. Acids, generally speaking, in proper dosage are tonic in their effect; they usually increase the appetite and improve the digestion. They increase the salivary secretion and overcome thirst and nausea. Acids given before meals lessen the acid secretion of the gastric follicles, and also prevent fermentation and arrest hyperacidity. The mineral acids, in proportion to their dose and methods of application, are escharotics, antiseptics, disinfectants, and even hematinics. In concentrated form they have the power of destroying morbid tissue and of devitalizing normal structures. In diluted state the mineral acids possess astringent properties, checking morbid secretions and discharges, and lessening hemorrhage, especially in morbus maculosus and hemorrhagic purpura. The mineral acids containing chlorine are valuable tonics in many diseases, especially of the stomach and liver, from which many skin affections develop. The mineral acids are often invaluable as antiseptics and refrigerants in the fevers, more particularly the eruptive fevers (notably small-pox and hemorrhagic measles). The vegetable acids have similar refrigerating effect, but are more feeble in their action. The vegetable acids act more decidedly upon the eliminative organs, especially the skin, bowels, and kidneys. They have therefore a tonic and alterative action. The mineral and vegetable acids are, in consequence, of great value in treating many depraved conditions of the blood, such as occur in purpura and in fevers. The important mineral acids are hydrochloric, nitrohydrochloric, nitric, phosphoric, and sulphuric; the principle vegetable acids are acetic, benzoic, citric, lactic, salicylic, and tartaric acids.

**Astringents.**—Astringents are derived both from the inorganic and the organic kingdoms, and are divided conveniently into the mineral and the vegetable astringents. The former or mineral astringents comprise bismuth, zinc, alum, and the preparations of iron, copper, lead, silver and their salts, together with the mineral acids. The mineral astringents are of great service in the treatment of many diseases of glands, and of the mucous membrane of stomach and bowel. They are also of particular value in many diseases of the nervous system. It is well known that from both sources many diseases of the skin develop. The mineral astringents, internal and external, are very important antiseptic agents. The strong mineral acids and the salts of zinc, especially the chloride, are the very best caustic agents to apply to new growths upon and in the skin. The acid nitrate of mercury is a very powerful escharotic. The latter group is represented by varieties of tannic and gallic acids, and vegetable preparations containing these principles, such as kino, gambir, krameria, geranium, and hamamelis. Astringents usually, in the proper strength, coagulate albumin. They likewise produce contraction of unstriped muscular tissue, and, in very strong solution, many of them have a caustic or destructive action upon the skin. They excite muscular tissue, contract capillaries and glands, lessen secretion, and restrain peristalsis. The vegetable astringents are of service in many diseases like eczema, hyperidrosis, acne rosacea, seborrhea, and alopecia, and in all similar states in which the condition of the skin depends upon the relaxed and debilitated state of the bowel. They are likewise, when properly diluted, invaluable when applied externally, in the same class of diseases of the skin. Adrenaline is an example of an animal astringent.

**Geranium.**—Geranium, an indigenous plant, is probably one of the very best of the vegetable astringents. Internally, it improves the appetite, digestion, and nutrition. It is one of the most active astringents to employ, both within and without, in acute eczema. The tincture or the fluid extract may be used internally in from 2 to 4 c.cm. or from thirty drops to one drachm three or four times a day. It is of especial value in acute eczema of infants or children, in the form of a decoction. It often rapidly overcomes the excessive flow of serum and allays all irritation of the skin. In purpura, given internally, it often acts promptly and efficiently.

**Hamamelis.**[1]—The preparations of hamamelis or witch-hazel, made from the fresh and dried leaves, are most active physiologically. They have decided therapeutic power, both as an astringent and as a sedative. Witch-hazel has likewise, beyond all doubt, a decided influence on the muscular fibres of the middle coat of the veins. This action is well illustrated clinically in treating hemorrhoids, especially when attended with much vascularity and itching. The application of the witch-hazel externally, and its internal administration in this tormenting disease, are usually attended with decided relief. As a local application for burns, frost-bites, erysipelas, eczema, herpes, hyperidrosis, boils, carbuncles, lupus, acne, acne rosacea, alopecia and seborrhea, the distillate of witch-hazel, alone or combined with other drugs, is both beneficial and curative. As a menstruum for the use of many important combinations to the skin, it is one of the most valuable preparations that we possess. For varicose ulcers of the limbs, the internal and external use of witch-hazel is one of the most efficacious of all remedies that can be employed. The official aqua hamamelidis, or distilled water of hamamelis, is a cooling application much used to relieve irritation, such as the itching of insect-bites, also erythema, sunburn, or lichen.

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[1] Hamamelis often acts with good effect given internally—in acute and subacute eczema, erysipelas, psoriasis, and varicose ulcers. See papers by the author, on "Hamamelis," read before the Section of Therapeutics, British Medical Association, Brighton, August, 1886. "Hamamelis in the Treatment of Diseases of the Skin," read before the Section of Dermatology at the meeting of the Association of German Naturalists and Physicians, held in Berlin, September, 1886. The Medical Bulletin, December, 1886.

**Hydrastis[1] or Golden Seal (Hydrastis Canadensis).**—Hydrastis is a tonic, hepatic stimulant, diuretic, and astringent. The official preparations are the fluid extract of hydrastis, the dose being from 0.30 to 2 c.cm., or from five to thirty drops; the glycerite of hydrastis from 2 to 4 c.cm., or from a half to one drachm; and the hydrastinine hydrochloride, the dose being from 0.03 to 0.13 Gm. or from gr. ss to gr. ij. Hydrastis, in the form of the fluid extract, or tincture (20 per cent.), is one of the best remedies to employ as a hepatic stimulant, tonic, and digestive in syphilis, eczema, acne, psoriasis, and in scrofuloderma. It is an invaluable remedy in purpura, in hyperidrosis, and seborrhea. All of the official preparations, and especially hydrastinine hydrochloride, possess hemostatic powers similar to ergot. Locally, hydrastis is a remedy of rare value. The fluid extract and the glycerite of hydrastis are excellent applications for all ulcers, especially in chancroids and in chronic eczema. It is of marked advantage, used upon all fissures of the skin, particularly fissures of the hands, feet, nipples, and rectum. As a gargle it is of great benefit, more especially in mercurial or aphthous stomatitis. An ointment made of the extract of hydrastis is also of service in the same class of patients just enumerated. For the destruction of fetor of wounds and unhealthy discharges from various diseases of the skin, it is most useful. Hydrastinine hydrochloride combines well with water, alcohol or fats, and I have experienced good results from it in hyperidrosis, seborrhea, acne, eczema, and in ulcers. Ten to thirty grains of hydrastinine hydrochloride in five ounces of water, or distillate of witch-hazel, have a beneficial action on excessive secretion about the axillary or inguinal regions, and on the palmar and plantar surfaces. This solution likewise removes the offensive odor in cases of bromidrosis. Weak alcoholic or aqueous solutions of hydrochloride of hydrastinine also act well in seborrhea sicca and acne. From five to thirty grains of the salt incorporated in an ounce of fatty substance is a good application in chronic eczema, in scrofulous, and varicose, ulcers, and allays the fetor of phagedenic and malignant ulcers.

**Argentum.**—The salts of silver, given in doses of 0.01 to 0.03 Gm. or from gr. $\frac{1}{8}$ to $\frac{1}{4}$, and the silver oxide in doses from 0.03 to 0.13 Gm., or from ss to gr. ij, are of great value in skin diseases. The silver salts given internally are tonic, hepatic stimulants and astringents. In catarrhal jaundice, upon which eczema and many other diseases of the skin may depend, the silver salts are invaluable. They are of great importance in treating many nervous diseases from which herpes, psoriasis, and other affections arise. Locally, silver, and especially the nitrate in dilute or appropriate solution form, is of great benefit in open wounds, ulcers, boils, etc.

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[1] See paper by the author on "Hydrastis and Hydrastinine Hydrochlorate in Diseases of the Skin," "Drugs and Medicines of North America," Cincinnati, September, 1885.

**Alum.**—Alum of the Pharmacopeia is potassium alum. It occurs in the form of translucent, white, octahedral crystals, with a sweetish, astringent taste and acid reaction. When the water of crystallization is driven off by heat, dried alum remains, which is employed as an astringent and mild escharotic. Alum is a good astringent used in the form of a powder, as dried alum, or as a solution. As a powder it is of benefit in sinuses, granulations, and ulcers, especially toe-nail ulcer.

**Bismuthum.**—The salts of bismuth are used very largely in the practice of medicine. They can be given in doses of from 0.32 to 1.30 Gm., or from gr. i to x, three or four times a day. They check excessive secretion and exert a sedative influence upon the skin and mucous membrane. They likewise have an astringent as well as an absorbent action. Poisoning may follow the too free use of any of the salts of bismuth, which is followed by a purplish line upon the gums. The discharges from the bowels are blackened by bismuth, the tongue may become coated by a slate-colored fur, intestinal concretions may occur. Slough may form in the mouth; gastro-enteritis, nephritis, and albuminuria may likewise develop. Bismuth is liable at times to be contaminated with arsenic. The salts of bismuth are often of benefit in many skin diseases depending upon acidity of the stomach, flatulent dyspepsia, diarrhea, and dysentery. Any one of the salts of bismuth, especially the subnitrate, the subcarbonate, and the carbonate, is of great service externally in acute eczema, erythema, chancroids, ulcers, unhealthy wounds, herpes, and erysipelas. The salicylate of bismuth is an invaluable antiseptic and an astringent in gastric ulcer, and in all internal malignant diseases. It is of especial service in cancer of the internal organs or mucous membrane. Bismuth subgallate or dermatol occurs as a fine, saffron-yellow powder, odorless and innocuous. It can be given in doses of from 0.3 to 1.30 Gm., or from gr. v to xx, every two or three hours. Bismuth subgallate is insoluble in water, alcohol, and ether. It is an astringent, antiseptic, and local anesthetic in action. It is of especial advantage as a dusting powder in acute eczema, pemphigus, herpes, hyperidrosis, and in all ulcers upon and in the skin. Bismuth subgallate in the form of an ointment, in from ten grains to one or more drachms to the ounce of a fatty vehicle, is of great benefit in all ulcers of the surface, in psoriasis, and in old cases of eczema.

**Cuprum.**—Copper has but one official salt, the sulphate of copper, the dose being from 0.01 to 0.13 Gm., or from gr. ⅛ to ij. Copper is an emetic, a tonic in very minute or small doses, an astringent, antiseptic and caustic. The sulphate of copper in crystal or solid form is a good caustic and astringent for indolent ulcers, exuberant granulations, especially in syphilis and other sores. Copper is useful externally, in solution form, to correct hæmorrhages, excessive and chronic discharges. Copper in solution form or as an ointment, is an excellent application for all vegetable parasitic diseases of the skin, especially in ringworm, favus, impetigo, chancres and chancroids, hyperidrosis, and bromidrosis. One of the most valuable local applications for the diseases referred to is a 5- to 30-per-cent. ointment of the oleate of copper. The oleate of copper ointment can also be employed with advantage in chronic eczema, sycosis, psoriasis, and acne. Internally, the sulphate of copper in minute or small doses, is a good tonic, especially for skin diseases depending upon anemia. It is also of benefit in syphilis and in glandular enlargements in children.

**Plumbum.**—Lead is a sedative, astringent, and hemostatic. The important lead salts used internally are the acetate of lead (sugar of lead), the dose being from 0.065 to 0.32 Gm., or gr. i to v; the iodide of lead, the dose being from 0.005 to 0.015 Gm., or gr. ss to ¼. The topical application of solutions of lead may cause brownish or blackish discolorations of the skin. Lead used internally may develop erythema, petechiæ or even symptoms of poisoning. Hyperesthesia or anesthesia of the skin may likewise be produced by the employment internally of lead. In all acute inflammation of the skin, lead alone, or as lead water and laudanum, is of service to relieve pain and inflammation. Lead in the form of a solution or an ointment often relieves itching and burning of the skin, especially in paresthesia, urticaria, eczema, psoriasis, erysipelas, furuncles, carbuncles, combustio, and congelatio. In many acute and chronic diseases of the skin the various lead salts have both a soothing and an astringent action. Lead checks excessive secretion, as in hyperidrosis and bromidrosis. The old lead plaster, alone or combined with salicylic acid, is of benefit in many diseases of the skin, especially in chronic eczema. It is of value in bed sores, in cracks or fissures of the skin. The iodide of lead is a solvent in glandular swellings and in scrofulous tumors. Glycerin of lead subacetate is a good application in eczema, particularly on the nipple and all muco-cutaneous outlets of the body.

**Zincum.**—There are many official zinc salts. Their doses vary from 0.065 to 0.20 Gm., or from gr. ¼ to j or more grains. The zinc salts are tonic, astringent, antiseptic, disinfectant, and caustic. The zinc ointment is a base for many applications to the skin. Zinc ointment, alone or combined with other medicaments, is of great service in many inflammatory diseases of the skin, especially in eczema, erysipelas, herpes, and in burns. The zinc ointment is not only an astringent, but it is likewise an antiseptic and sedative. The chloride of zinc, alone or combined with other agents, is one of the very best of all caustics. For the destruction of growths upon and in the skin, the chloride of zinc is most especially of service in verruca, exuberant granulations, epithelioma, chancre and chancroids. It is deeper and stronger in its penetrating power and leaves a healthier escar than almost any other caustic that can be used upon the skin. Zinc chloride can be employed in the solid form, with just enough of water to place it in solution, or it can be applied in the form of a paste, as used by Vohwrinkel, as follows: zinc chloride, 4 parts; farina, 3 parts, and zinc oxide, 1 part. Zinc used as a powder, as the powdered oleate of zinc, carbonate or impure carbonate or oxide of zinc, are all valuable dusting powders for excessive discharge upon the skin. These same powders are valuable as toilet preparations upon the skin, having a mild astringent action upon the glands at the same time. The salts of zinc, especially the oxide of zinc and the valerianate, in doses of 0.0065 to 0.20 Gm., or from gr. ¼ to iij, are invaluable tonics internally in all integumentary diseases of the skin depending upon some nervous affection.

**Antipyretics.**—Antipyretics reduce abnormal temperature. Water and its various modifications as to temperature, especially in the form of ice, is one of the best of all antipyretic agents in nature, used internally and externally in many febrile diseases.[1] Water is of particular value to reduce abnormal temperature in the eruptive fevers. Many drugs act well as antipyretics. Antipyrin, phenol, resorcin, and other coal tar products reduce abnormal temperature often so rapidly as to prove dangerous remedies to employ as antipyretics. Camphor, benzoic acid, eucalyptol, salicylic acid, the salicylates, salicin, thymol, pilocarpus, opium, quinine, ipecacuanha, antimony, the preparations of ether, alcohol, digitalis, aconite, veratrum viride, and gelsemium are all good antipyretics. Among the most important of the drugs employed as antipyretics in the treatment of diseases of the skin are salicin, pilocarpus, and the cinchona preparations.

**Salicin.**—Salicin is a glucoside from several species of salix and populus. The dose is from five to ten grains. It occurs as white silky crystals, having a very bitter taste. It is soluble in water and alcohol. Salicin is both a bitter tonic, antiseptic, and antipyretic. It is well borne by the stomach, promotes digestion, and reduces fever, especially in rheumatic and gouty diseases attended with eczema or psoriasis. In many of the eruptive fevers, as variola, varicella, scarlatina, morbilli, and cerebrospinal or spotted fever, it acts promptly in large doses in overcoming abnormal temperature.

**Pilocarpus.**—Any one of the official preparations of pilocarpus, which dissipate heat, in evaporating perspiration, act as valuable antipyretics. Pilocarpus is, therefore, useful in reducing temperature in erysipelas, in scarlatina, in nephritis, and in many cases of chronic skin disease where the surface is harsh, rough, dry and infiltrated. It has been employed with advantage in urticaria, hyperidrosis, and bromidrosis.

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[1] See author's chapter in "Materia Medica and Therapeutics," seventh
1908, p. 1042.

**Cinchona or Peruvian Bark.**—The preparations, alkaloids and salts of cinchona, are astringents, antiseptics, tonics, and antipyretics. It is well here to note that toxic symptoms are often produced by quinine and the various preparations containing one of the cinchona alkaloids. In some individuals a very small application in the external use of cinchona or its alkaloids, especially quinine, may give rise to this toxic action or what is known as cinchonism. An erythema or general efflorescence of the skin, which is often mistaken for scarlatina, vesicles, and pustules, often rapidly appears as the first evidence of the toxic action of cinchona or one of its alkaloids. Caution must, therefore, always be instituted in the administration of this drug or any of its alkaloids to avoid the toxic effect which they may set up.

**Red Cinchona Powder.**—The powdered bark of the red cinchona, made very fine and then passed through bolting cloth, is one of the very best astringent and antiseptic applications to the skin. It is now practically obsolete as an application. In the past, however, long before the numerous antiseptic powders were brought forward, the red cinchona powder was used with very great benefit. Many years ago, when I was a very young assistant upon the great surgical clinics of the late Professor Joseph and Prof. William H. Pancoast at the Jefferson Medical College Hospital, the important astringent and healing power of the red cinchona powder was demonstrated by these surgeons. Little was known in those days of the modern asepsis or antisepsis, and the many powder combinations that have since developed to destroy germ life. The elder Pancoast, in removing the breast and treating ulcers and sinuses, always applied with great success the fine red cinchona powder. For upwards now of thirty-four years I have had the most decidedly good results in sinuses, ulcers, after a curettement of the skin, opening abscesses, boils, and carbuncles, by the use of the red cinchona powder. As a dusting powder for bromidrosis and hyperidrosis, it has no equal among all the antiseptic powders that the author has recommended. It is both economical and effective for many diseases of the skin, especially in the subacute and chronic types.

Quinine, in the form of the sulphate, bisulphate, the hydrobromide, hydrochloride or salicylate, in doses of from 0.065 Gm. or gr. i to xv, is an admirable tonic or antipyretic in many diseases of the skin. Cinchona and its salts, taken internally, increase the secretions of the stomach, improve the appetite and digestion, destroy micro-organisms, and prevent fermentation. In the blood the salts of cinchona arrest the migration of the white corpuscles, check their ameboid movement, render the red cells less adhesive, and their oxygen-carrying function is impaired. Further, quinine or the other alkaloids of cinchona, in moderate doses, increase the pulse rate, and larger doses cause lowering of the pulse and arterial tension. Inflammatory degenerations of the tissues are decreased. Quinine likewise makes a more favorable influence upon the healing of all inflammatory tissue. As noted above, the wonderful physiological action of cinchona and its salts upon secretions, circulation, and tissues, makes this drug one of the most useful of all preparations in the care and treatment of many acute and chronic diseases of the skin.

Quinine is an appropriate remedy to employ in skin diseases arising from malaria and from all impoverished conditions of the blood, as in impetigo contagiosa, impetigo, carbuncles, furuncles, sycosis, etc. Quinine is beyond all doubt the most important of all drugs to reduce abnormal temperature in erysipelas and the eruptive fevers. In some patients it causes erythematous, even hemorrhagic, eruptions on the skin.

**Antimony.**—The preparations of antimony that have been so well known and so useful in the past, and especially with the older members of the profession, have until recently been seldom employed. The writer has for many years used the preparations of antimony with excellent results. The official preparations are: Antimonii et potassii tartratis, antimony and potassium tartrate, or tartar emetic, the dose being from 0.0016 Gm. to 0.065 Gm., or gr. ¼ to gr. j; antimonial wine or vinum antimonii (contains about 4 Gm. tartar emetic to each 1000 c.cm., or 0.13 Gm., or gr. ij in each 30 c.cm. or f℥j), the dose being 0.12 to 2 c.cm. or ♏ ij to xxx, as an expectorant; or 4 to 8 c.cm. (fʒj to fʒij) as an emetic for adults. Antimony is a powerful irritant, and when applied to the skin or mucous membrane, it causes a burning sensation, with redness and pustulation resembling small-pox, followed by ulceration. Antimony when taken internally, quickly diffuses into the circulation which it lessens and assists in eliminating the waste products by the alimentary canal, the kidneys, and the skin. In most of the inflammatory affections with elevation of temperature, it will exercise a beneficial influence in reducing the exudation and the temperature. Antimony often acts well in chronic eczema, psoriasis, scrofuloderma, syphilis, by allaying the congestion and irritation of the skin. Mr. Morris, of London, believes that antimony is likely to be of special value in cases dependent upon functional nervous disorder.

**Refrigerants.**—Refrigerants reduce local temperature and allay thirst. Water within or without, in the form of cold or hot water, lessens thirst, and gives relief in fever. Glycerin applied to the tongue moistens its surface and allays thirst. Among the other refrigerants are the vegetable and mineral acids, iced tea, coffee, the sparkling wines, especially champagne, and the aërated mineral waters. The application of an ice-bag relieves congestion of the viscera, and also allays pain (useful in pneumonia, meningitis, appendicitis, etc.).

**Hypnotics and Anodynes.**—Hypnotics cause sleep; anodynes allay pain. A hypnotic by causing sleep allays pain and all irritation; an anodyne by overcoming wakefulness will produce the same effect. Hypnotics act principally by influencing the circulation through the brain; ar dynes by their action upon the sensory centres.

The principal hypnotics and anodynes to be used in skin diseases are opium and its alkaloids, especially morphine, paraldehyde, chloral hydrate, hyoscine, the bromides, alcohol, and gelsemium.

Of course, the production of sleep and the alleviation of pain and irritation from many skin diseases may be brought about by many simpler means than the employment of the drugs named. Electricity if properly administered may be used so as to either produce sleep or relieve pain. The application of massage may likewise produce sleep and overcome pain. The various baths, especially the warm or hot bath of water, the steam bath, the Turkish or Russian baths, may be followed by sleep and the relief of pain. The administration of hot drinks, tea, milk, or the various broths, may bring about the same effect. A change of climate or diet are very often the very best sleep producers known to the physician. The simplest hypnotics in nature are the very best before the physician resorts to the use of drugs. As the various drugs just named are well known to all practitioners, the author proposes only to allude to hyoscine and paraldehyde which are both frequently employed as sleep-producing agents.

**Hyoscine Hydrobromide, also known as Scopolamine Hydrobromide.**—Hyoscine hydrobromide is a principal derivative of hysocyamus niger or of scopola carniolica, the dose being from 0.0003 to 0.0006 Gm., or gr. $1/200$ to $1/100$. The hypodermic injection of a moderate dose of hyoscine hydrobromide, which is the best way of administering this drug, is followed in a very short time by a calm and refreshing slumber. Sleep as a rule, continues for several hours, with no ill effect upon awakening. Hyoscine is especially applicable to very nervous patients and those with mental disorders. Any one of the mydriatics, as belladonna, hyoscyamus, scopola, or stramonium, may be substituted in place of hyoscine in case the physician wished to administer the official preparation by the mouth. It must be borne in mind, however, that all alkaloids of the mydriatics, including hyoscine, or scopolamine, often have a rapid and a decided toxic action by the development of vertigo, loss of consciousness, stupor, and death. Opium or morphine used with hyoscine increases the action of the latter drug, and many deaths have been reported from this combination hypodermically.

**Paraldehyde.**—Paraldehyde is a colorless mobile liquid, dissolving in eight volumes of cold water, and is less soluble in hot water, but dissolving freely in alcohol and ether. Paraldehyde has a burning unpleasant taste, and a penetrating, ether-like odor. It may be administered in syrup, vegetable bitter, or aromatic water, in doses of 1.20 to 7.5 c.cm., or *m* xx to fʒij, or one-half to two teaspoonfuls.

Paraldehyde is one of our very best hypnotic agents, with no depressing action upon the heart and circulation. It has no disturbance upon the digestion. Paraldehyde not only acts as a hypnotic, but as an expectorant, diuretic, and diaphoretic. This colorless liquid is rapidly absorbed and produces a most refreshing slumber with no ill after-effects. In eczema and other diseases of the skin, causing a loss of sleep, it is a most admirable and effective remedy.

**Alteratives.**—Alteratives possess the power of modifying deranged nutritive process. Alteratives in small or minute doses increase the red corpuscles, and improve the quality of the blood. Alteratives, likewise, improve the appetite, the digestion, the assimilation, and the nutrition. They change the character of secretions, promote absorption and elimination, reinvigorate the circulation, the respiration, and the activity of the nervous centres. The principal alteratives are the preparations of arsenic, mercury, iodine, sulphur, gold and sodium chloride, oleum morrhuæ, phosphorus, colchicum, guaiacum, sarsaparilla, stillingia, and other vegetable alteratives.

**Arsenic.**[1]—Arsenic is useful in some affections of the skin, and useless in others. It is also valuable in some stages of eruptions, and absolutely injurious in others. The disease as well as the stage of the eruption, must be carefully considered before it is employed. It has been shown to possess an action upon the epidermis, and is especially beneficial in diseases involving that part of the skin. Administered to animals, especially the horse, it improves nutrition and power, and gives a sleek and glossy appearance to the coat. Gubler,[2] in speaking of this effect, says Tschudy, in his account of the arsenic-eaters of Lower Austria, remarks that it improves their appearance and gives them additional power: "They acquire great strength, have remarkable agility, climbing the steepest mountain-sides; . . . the young girls, veritable rosebuds, as colored as ripened apples; they acquire flesh even; and, as fine skin is never seen in their people, over bones thinly covered, their skin becomes clearer and transparent." Arsenic the same author states, will not always give such admirable results, and, when its *habitués* come to require considerable doses, serious effects may ensue. From what has been recounted, the wonderful power will be observed that this metal possesses of modifying and changing the epidermis.

Administered for its effect upon the skin, the action of arsenic is usually slow, often requiring some time before a given result is obtained. When an impression has resulted from its use, it should be persistently continued, but in smaller doses, for a time after all symptoms of the eruption have vanished. It is contra-indicated in the inflammatory or acute stage of all eruptions, and if employed then may be followed by injurious effects from its stimulating action on the epidermis. In other words, it should not be given in active cell-proliferation, but during the stage of decline or chronic period of eruption, in which the affection is situated in the superficial portion of the skin. It is a useful remedy in psoriasis and eczema, after the inflammatory period of these diseases. It often acts happily in obstinate and chronic cases of papular eczema, pemphigus, lichen ruber, and at times in secondary syphilis. It can be taken in small doses, by most persons, or administered hypodermatically for a very long time, without injury to the health. Some persons are at times quickly and easily affected by small doses; others, who have some alimentary disorders, will not tolerate its internal administration. Its success, therefore, often depends upon a judicious manner of administration so as to overcome these objections and permit it to be acceptably received by the tissues. If the subject has a peculiar idiosyncrasy, beginning with a minimum dose, or combining with it either opium, bromide of potassium, quinine, pepper, etc., or a bitter, or an aperient, will often cause it to be better borne, and at times enhance its therapeutic value.

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[1] "The Useful Administration of Arsenic in Diseases of the Skin," by Edward L. Keyes, M.D. Journal of Cutaneous and Venereal Diseases, August, 1886. New York. Also "The Question of the Value of Arsenic in Diseases of the Skin," by W. A. Hardaway, M.D. *Ibid.*

[2] Gubler's "Therapeutics," p. 278.

If arsenic is not tolerated by the alimentary canal, the same result may be reached by the hypodermatic method of administration. It may therefore be employed according to the indications in each case, either given by the stomach or hypodermatically, to produce its systemic effects. The preparations of arsenic usually employed are arsenic trioxide, the arsenate of sodium, and the solution of arsenite of potassium (Fowler's solution), or the solution of arsenate of sodium (Pearson's solution). In the majority of cases, I prefer using the arsenous acid or the arsenate of sodium, to any one of the solutions of arsenic. My reason for this preference is, that arsenic solutions are often uncertain, being poorly or improperly prepared, or, if kept on hand too long, a chemical change may take place, which lessens their activity. Arsenic preparations are often thus given by the most skillful without producing any decided effect. If the physician is certain beyond all doubt that the solution is fresh and properly prepared, it will be equally effective with the arsenous acid or the arsenate of sodium. The advantage, however, in giving the latter is that their effectiveness, if arsenic will have any over the disease, is certain beyond all doubt. While I have employed the iodide of arsenic, and the solutions of the arsenate of sodium, and the iodide of arsenic and mercury (Donovan's solution), I have not had as good results from their use as from the other preparations already named. Arsenic trioxide and the arsenate of sodium are not only preferable for their therapeutic effect, but they are likewise a ready and convenient form of administering arsenic either alone or combined. They can be prescribed, to begin with, in a very minute dose, from one one-hundredth to one-tenth of a grain, given as pills three times daily, which can be carried around and readily taken by patients without the least trouble. It is best to administer the pills immediately after a meal, when, according to the views of Ringer, the arsenic becomes absorbed by the lacteals, and through them mixed with the blood; while, if the stomach is empty, it is absorbed by the veins, and, passing into the liver, is separated with the bile. The dose of arsenic trioxide can be slowly increased, given in the above manner, until it reaches the limit of toleration, which may be recognized by the metallic taste, increased flow of saliva, itching and swelling of the eyelids, and an unpleasant sensation over the epigastrium. The patient during the period that arsenic is being administered should have all the secretions kept in an active condition, and should be under the constant observation of a physician. In the event that the medicine shows the slightest evidence of producing its constitutional effect, the dose should be decreased, or the remedy withdrawn, and one of the bitter tonics substituted for a time until it can again be safely resumed. If these precautions be observed, no unexpected or violent action need result from its administration. I have had numerous cases in which arsenic, in the manner described, has been given for a very long time with great tolerance and without the least injurious effect. I believe that in many instances in which it has suddenly given rise to toxic effects, the accident has been due to subjects pursuing an arsenic course of treatment without being under the constant observation of the physician. The prescription, ordered two, three, or four weeks previously, has been renewed time and again, the patient failing to return for advice until toxic effects, or some unexpected symptom appear.

In using the solutions of arsenic for their systemic effect, the best and most serviceable are the solutions of the arsenite of potassium (Fowler's), or liquor arsenici chloridi, or the arsenate of sodium (Pearson's), from one to twenty drop doses after meals, either administered alone or given with an aromatic water, or simple bitters.

It is well, in order to avoid any idiosyncrasy that the patient may have, to begin always with the minimum dose, viz., from one to three drops.

Some practitioners prefer, in giving arsenic in a solution, to use the arsenate of sodium, which it is said is better and more easily absorbed than that of the arsenite of potassium. The solutions of arsenic, for the same reason that has been mentioned when speaking of arsenous acid and the arsenate of sodium, should always be given after a meal. If they agree with the patient, the dose can be gradually increased daily, or every second day, drop by drop, until a decided effect is apparent on the eruption. The solutions, like the solid preparations, can often be advantageously combined with other drugs, which enhance their value and render them easily borne. They can be prescribed with the tinctures of cinchona and serpentaria, the bromide of potassium, etc. In cases in which arsenic produces acne, the addition of the bromide of potassium to the prescription will prevent or lessen their development. Dr. T. N. McLaughlin, of Washington, D. C., has derived advantage from the administration of realgar or bisulphide of arsenic, in psoriasis, chronic eczema, scrofuloderma, ac and furunculus. When practicable, a resort to natural springs which contain arsenic is beneficial. Another form in which arsenic has recently been given with good effect is cacodylic acid or its combination with sodium. This acid contains 54.3 per cent. of metallic arsenic, or 72 per cent. of arsenous acid, in an organic form, is a white, crystalline powder, readily soluble in water, and may be given in doses of from 1 to 3 grains. It has been hypodermically injected with advantage in daily doses up to 6 grains. This preparation has been used in cases where arsenic is indicated, particularly in psoriasis, acne, lichen, and pemphigus.

I now pass to the consideration of the effect occasioned by the introduction of arsenic into the subcutaneous tissue. By this method the same physiological and therapeutic effects occur as when the metal is given by the stomach. This fact was demonstrated by Dr. C. B. Radcliffe, who first injected solution of arsenite of potassium under the skin of a patient suffering from chorea. M. Lipp injected arsenous acid in psoriasis and chronic eczema, the results of which he reported as successful. Since that time the same method has been used and commended in various parts of the world. It is to be regretted that this ready means of introducing arsenic rapidly and beneficially into the system is so little used. I regard it as the very best manner for producing a speedy, powerful, and effective impression upon the diseased skin. The arsenic is not altered or lessened in its action, as by a diseased stomach, the presence of food, the condition of the fluids, veins, nerves, and liver, and consequently its therapeutic effects are produced to the fullest degree. This method is especially adapted to the treatment of obstinate cases of psoriasis and eczema. It is also of value in sarcoma and lichen planus. It spares the digestive organs, and abridges very much the duration of treatment. I first tested this excellent method in 1876, and after years of experience have found that I can often arrest and cure obstinate cases which resist arsenic given by the stomach. Mercury administered by the stomach for syphilis will sometimes prove ineffective, but when used hypodermically, cures often follow; so also arsenic given hypodermically will in some instances produce more marked systemic effects. I began by using the solution of the arsenite of potassium diluted; later, a weak solution of arsenous acid; and now I generally administer either the arsenous acid or the arsenate of sodium in solution. Some regard the latter preparation as the most acceptable, as it is a higher oxide than the arsenite of potassium, is less irritant in its local action, and not so liable to be followed by toxic symptoms. I usually have the arsenate of sodium made into pellets of various strengths, beginning with one-tenth of a grain, one of which is dissolved in ordinary water (distilled water, however, as a medium is always the best), and deposited daily into the areolar tissue over some part of the back. In the course of a few days the dose is gradually increased, until some evidence of the action of the metal is observed either upon the disease, or by its constitutional effect. I have in this manner given as high as from one-quarter to a half and in one instance one grain daily, without injurious results. The effect is usually very speedy; in some individuals it was observed in two weeks, in others from six to eight weeks. As soon as the systemic or local action of arsenic is noticed, the dose should be decreased to the minimum amount. In case the disease persists, it can again be gradually increased. It is proper to bear in mind that in exceptional cases arsenic gives rise to cutaneous manifestations. These may occur irrespective of any signs of systemic intoxication. A diffuse, more or less general, erythema is sometimes produced by a few doses. This rash may or may not attack the face. Prof. James Stewart[1] met with a patient in whom wart-like excrescences formed upon the dorsal surfaces of the hands and fingers. In a similar case involving the palms and soles, observed by Dr. Pringle, there was a universal thickening of the epidermis of the affected parts with well-marked hyperidrosis. A brown pigmentation occasionally develops in consequence of an arsenical course. The discoloration may appear on any portion of the body. It may exist as disseminated patches or may be so generalized as to present the appearance characteristic of Addison's disease. This pigmentation gradually disappears after the remedy has been suspended. Mr. Jonathan Hutchinson supposes that a course of arsenic prolonged for years is capable of producing epithelioma. The evidence upon which he founds this belief seems inconclusive, and the result, if really due to the drug, must be of very rare occurrence.

**Mercury.**—Mercury is an alterative—tonic, diuretic, bactericidal, and has antiseptic action. It is an effective antiphlogistic agent. In small doses it improves the quality of the blood, especially increasing the red corpuscles. By this action, in combination with its destructive effect on the spironema, it forms a powerful agent for combating and treating syphilis. It can be employed with advantage in minute doses in the treatment of eczema accompanied with severe inflammatory symptoms, particularly in children having the pustular variety. It is also of value in small doses in the treatment of many other inflammatory affections of the integument, among which may be mentioned lupus, sycosis, chronic eczema, psoriasis, and scrofuloderma. Mercury may be introduced into the system by inunction, fumigation, the hypodermic method, or by the stomach. In the treatment of obstinate and chronic forms of syphilis, the hypodermic method is to be preferred. It is cleanly, more economical, and more rapid in its action in arresting the disease. If mercury is administered by the mouth, the corrosive chloride, the mild chloride, blue pill, mercury with chalk, the yellow mercurous iodide, and the red mercuric oxide are used. The drug should usually be given in the beginning in very small doses, and its effect watched in order to prevent ptyalism. A minute quantity, as the one-twentieth to the one-sixtieth, for instance, of the corrosive chloride, or the mild chloride, well rubbed up with sugar, or triturated, and given in frequently repeated doses, acts more decidedly than larger doses at longer intervals. Mercury may be administered alone or given in combination with other substances; the best example of which is the liquor arsenici et hydrargyri iodidi, which in from five- to fifteen-drop doses is of utility in syphilis, sycosis, and in the various forms of cancer.

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[1] Canada Medical and Surgical Journal, April, 1888.

**Iodine.**—The preparations of iodine have a large range of usefulness in affections of the skin. They are said to influence the elimination of waste products. Iodine is effective in small doses in the treatment of scrofula and lupus. The iodide of potassium or of sodium, but preferably the former salt, is one of the most effective remedies in the treatment of the tertiary stage of syphilis, also in leprosy and in actinomycosis. As iodine and its preparations may produce a variety of cutaneous eruptions, they should be cautiously used. The usual dose of the tincture of iodine is from one to five drops, and of the iodide of potassium or sodium from five to sixty grains. In the tertiary form of syphilis, particularly if attended with ulceration, large doses should be administered, in order to produce a decided effect. To avoid the gastric disturbance which not infrequently results from the prolonged administration of iodine or its salts, we are now provided with an admirable remedy in the syrup of hydriodic acid. One fluid ounce of this preparation contains some six and a half grains of iodine, and the dose is from half a fluid drachm to half a fluid ounce. It is relatively more powerful than iodide of potassium, since nascent iodine is liberated in the stomach. The syrup of hydriodic acid is valuable in syphilis, especially in the later stages of the disease, and is tolerated when the stomach has become rebellious to the iodide. It is of great efficacy in the eczema of feeble or scrofulous children. In scrofuloderma and lupus vulgaris it is likewise of service. Dr. Hugh Woods, of Highgate, has introduced another substitute for the iodides in the hypiodite of potassium (liquor potassæ iodinatæ). Each ounce of the solution contains some twenty-eight grains of iodine in a loose combination, and nascent iodine is set free by the action of the gastric juice. It is given in doses of five to ten minims. When shaken up with an equal quantity of olive oil, it forms a soapy liniment which is a valuable antiseptic remedy for external use.

**Iodoformum.**—The antiseptic and anesthetic properties of iodoform render it a very valuable application in many diseases of the skin. This substance is efficient, not so much by destroying the micro-organisms of disease, as it is by rendering the tissue upon which it is spread an unfavorable soil for bacterial development. It is probably also able to counteract the effect of microbian products and has some analgesic influence.

Iodoform is a decidedly beneficial topical remedy in various inflammatory conditions, especially after suppuration or ulceration has occurred.

In chancroidal bubo, or in scrofulous adenitis, it may prevent the formation of pus, or degenerative tissue changes. It may be lightly powdered over the affected surface, spread upon the integument in the form of an ointment or, mixed with oil or glycerin, be injected into the focus of inflammation. If tissue has been destroyed, the granulations are stimulated and sterilized by a covering of iodoform. This beneficial effect is especially seen in syphilitic lesions of mucous surfaces, which rapidly heal under iodoform applied daily. Ulcerated bubo, chronic ulcers of the leg, scrofuloderma, and bed-sores are markedly improved by the use of this agent. In abscess, ecthyma, furuncle, and carbuncle it is of no less service. Iodoform has been extensively and successfully employed in the treatment of venereal ulcers. This substance is one of the best applications to chancroids and is of particular efficacy in phagedena. All syphilitic lesions are amenable to its influence, especially open chancres, moist papules, ulcerated tubercles, and the ulcers of the tertiary form. It is likewise a valuable remedy in burns. The exposed surface is protected from the attacks of micro-organisms, while at the same time the dressing acts as a local anesthetic and reduces suffering. To the open lesions of lupus vulgaris, iodoform is a beneficial application. The pain of ulcerated carcinoma is appreciably assuaged by means of this agent. The application of iodoform is at times attended by satisfactory results in chronic eczema, and has been advised in prurigo.

The forms, in which iodoform has been used as a local remedy, have been already mentioned. The particular methods according to which it is employed in the various affections to which I have alluded will be detailed in the sections on the treatment of those diseases.

Notwithstanding the undeniable efficacy of this substance in a variety of conditions, two serious drawbacks attend its use. The first consists in its persistent, penetrating, and offensive, garlicky, and easily recognized odor. Many expedients have been devised for the purpose of overcoming this characteristic property. The combinations which have proved most successful are enumerated upon a subsequent page. A more grave objection is the toxicity of iodoform. Its absorption may be followed by prostration, headache, faintness, elevation of temperature, delirium, suicidal mania, or death. In cases ending fatally, the kidneys, liver, heart, and voluntary muscles have been found in a state of fatty degeneration. Circumspection, therefore, should always be observed in the employment of this potent drug. Some cases of poisoning have been attributed to adulteration of the drug with picric acid. It is important, therefore, that only a pure, sterile iodoform should be used for medical purposes. Messrs. Johnson & Johnson have introduced a modification which is without odor, and which they offer as a substitute, under the name of "Odorless Iodoform." Di-iodoform, a yellow substance almost free from odor, is also used in place of iodoform in ulcerated chancroids and wounds.

**Iodolum.**—This compound, which contains about 90 per cent. of iodine, was introduced as a substitute for iodoform. Iodol is almost insoluble in water, but is soluble in chloroform, ether, and fatty oils. It is destitute of odor, slowly absorbed but rapidly eliminated, and is much less apt than iodoform to produce toxic effects. It has been given with advantage internally, in doses from one-quarter to five grains, for the manifestations of scrofula and tertiary syphilis. Iodol has chiefly been used, however, as a topical remedy. This substance is destructive to microphytes, and is therefore efficacious in diseases attended by suppuration as well as in those which depend upon the growth of a vegetable parasite. Venereal, syphilitic, or common ulcers, lupus, impetigo, furuncle, and carbuncle are benefited by the application of iodol. In variola it moderates the intensity of the eruption, is an excellent dressing to enlarged or degenerated glands, and is of service in psoriasis. Iodol has been employed with success in tinea tonsurans.

Iodol may be used as a dusting-powder, an ointment, or in solution. One part of iodol dissolved in sixteen of alcohol and thirty-four of glycerin, constitutes an excellent preparation for local use.

**Thymolis Iodidum, or Aristol.**—In this substance we have another excellent antiseptic and germicide, which has proved itself a valuable addition to our therapeutical resources and is now official. Discovered in 1889, by Messinger and Vortmann, of Aix-la-Chapelle, it was first employed clinically by Eichhoff, of Elberfeld. Aristol is a compound of iodine and thymol (dithymol di-iodide), containing 45.8 per cent. of the former substance. It is a soft, fawn-colored powder, having a faint and not unpleasant odor. It is insoluble in water and glycerin, but is readily soluble in ether, chloroform, fixed oils, and liquid petroleum. It adheres readily to the surface of the skin, or of a wound, or ulcer, is a mild stimulant but not a decided irritant, and possesses some local anesthetic power. It stimulates the absorbent vessels, though it is not itself absorbed by skin, mucous membranes, or raw surfaces, and therefore exerts no toxic action.

Thymol iodide promotes the absorption of inflammatory exudates, and is a useful application in thickened conditions of the integument. It is of special service in the treatment of varicose-leg ulcers and the ulcers of late syphilis. In ulcerated lupus, likewise, it is of decided benefit, but is useless while the skin is still unbroken. Spread upon chancres and ulcerated buboes, it hastens cicatrization. It not infrequently causes retrocession of enlarged lymphatic glands, and promotes absorption after degeneration has occurred. Iodide of thymol is efficacious in ulcerated epithelioma. This remedy is of avail also in the treatment of burns, scalds, frost bite, and in squamous and seborrheic eczema. In psoriasis, it is of equal value to chysarobin, though less rapid in its action. Its germicidal property renders it useful in tinea trichophytina. Iodide of thymol is also uniformly productive of benefit in hyperidrosis, bromidrosis, acne, and rosacea. This substance may be employed as a dusting powder, alone or combined with carbonate of zinc or subnitrate of bismuth, or as an ointment, 10 per cent. or more being rubbed up with any suitable excipient.

**Sulphur.**—Sulphur or brimstone is a non-metallic substance possessing many forms and preparations. It is one of the oldest and best of all the remedies now employed in medicine. Sulphur is abundantly distributed in nature as the sulphides. It is also an important constituent in many of the mineral springs. It is likewise a constituent of albumin and is present in nearly all the solids and fluids of the body. From the facts just enumerated we are led to believe that sulphur is essential to the health of albuminous organs and tissues, and is an important element of nutrition. In addition to being a valuable alterative and purgative, it has also antiseptic and germicidal effect in exercises, and a prophylactic influence in preventing under ordinary circumstances the invasion of the tissues by micro-organisms. It is one of the best of all intestinal disinfectants.

Sulphur[1] given internally in from one grain to two drachms, in syrup, honey, or milk, may produce excellent results in alopecia, diseases of the nails, and glandular affections. The most elegant and useful preparation of sulphur is calx sulphurata. It will, in from one-quarter to one-grain doses, three or four times daily, prove a useful remedy in acne, and in boils and abscesses. It will lessen the formation of pus. A natural sulphur water, as the Bedford, of Pennsylvania; the Sharon and Richfield, of New York; the various Virginia sulphur springs, and Blue Lick water of Kentucky, can be prescribed with advantage in the same class of affections.

Sulphur given alone or combined with other remedies in chronic eczema, and psoriasis, lessens the congestion and overcomes the infiltration of the skin. In chronic acne, rosacea, hyperidrosis, and in many diseases of the hair, especially in alopecia, moderate doses of sulphur act well upon the diseased structures. In diseases of the nails, sulphur, given internally, often assists in restoring these appendages to a healthy state. Externally, sulphur in the form of baths, lotions, and ointments, acts in a most decided manner. It so stimulates and alters the tissues by its applications as to bring about a reparative action, especially in chronic eczema, psoriasis, acne, rosacea, seborrhea, and in all pigmentated conditions of the skin. In both animal and vegetable parasitic diseases it is most effective in its action. Sulphur enters into various combinations, a few of which may here be named.

**Ammonium (or Sodium Ichthyosulphonate).**—Ichthyol, which is a substance having the appearance of tar and odor of coal gas, was brought to the notice of the profession through Unna, of Hamburg. It is procured, by distillation, from a bituminous rock in the Tyrol, composed principally of fishy and other fossil material. It contains, according to

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[1] See paper by author on "The Physiologic and Therapeutic Actions of Sulphur." Transactions of the Pennsylvania State Medical Society, 1890.

Schmidt,[1] carbon, 55.06; hydrogen, 6.06; sulphur, 15.27; sodium, 7.78; oxygen, 15.83; and combines well with alcohol, ether, and all fatty substances. It has a similar effect to that of both sulphur and tar, with often even a more decided and beneficial action. Unna states that it will not produce ordinarily any irritating action in chronic skin affections, in which it is a useful remedy. But this assertion requires qualification, for I have, not infrequently, seen it irritate the integument. Nor is it easily absorbed according to my experience. In from a 5- to 30-per-cent. ointment it is generally serviceable in psoriasis, eczema, rosacea, furunculosis, lichen, keloid, and ichthyosis. The ointment is also used in small-pox, to prevent pitting.

Ichthyol is serviceable in that stage of acne which demands stimulation, and has been used with advantage in frost-bite, burns, and ulcers. This remedy will sometimes ameliorate urticaria and paresthesia and may be a good dressing in erysipelas. In the last-named affection it may be used as an ointment, or dissolved in a mixture of ether and glycerin or ether and collodion.

Sinclair reports a deep stupor following the too free application of a 20-per-cent. ointment in an infant; this case, however, recovered.

Ichthyol is also useful sometimes administered internally in chronic eczema, psoriasis, and other cutaneous diseases. The dose is from two to ten drops three times a day. A case of tuberculo-anesthetic leprosy has been treated with drachm doses three times a day, and reported cured, by Ohman Dumesnil, of St. Louis.

**Thiol.**—A substance of similar chemical composition to ichthyol has been introduced as a substitute for the latter substance. Thiol is a mixture of sulphuretted hydrocarbons rendered soluble in water by treatment with sulphuric acid. It is estimated to contain about 12 per cent. of sulphur. As made by Riedel, it occurs in the form of a soft gray powder, or as a watery solution, of the consistence of a thick syrup containing 40 per cent. of thiol. The powder is obtained by evaporating the liquid. The compound is devoid of odor, and can easily be removed from the skin or clothing. The powder is an excellent absorbent for use in moist eczema, erythema multiforme, erysipelas, burns, and pemphigus. Professor Schwimmer obtained especially good results in dermatitis herpetiformis and herpes zoster from a 10-per-cent. solution, painted twice daily upon the affected parts. The liquid is likewise serviceable in papular and pustular eczema. In acne and rosacea, good results have likewise attended the use of this remedy.

**Thio-resorcin.**—A sulphur substitution-compound of resorcin, an amber-yellow crystalline body, without odor, has been used as a substitute for iodoform in the dressings of wounds. This substance is insoluble in water and only partially soluble in alcohol and ether.

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[1] The Therapeutic Gazette, June 15, 1886.

**Tumenol.**—A mineral substance bearing this title has recently been discovered by Spiegel, and has been closely studied by Neisser, who recommends it as of value in certain affections of the skin. Tumenol, or tumenol-sulphonic acid, is allied to ichthyol, and, like the latter, is obtained from mineral oils, to which circumstance it owes its name. It is derived from an amalgamation of bitumen and oleum. The impure mother substance occurs among the unsaturated hydrocarbons of the oils, and is separated by the addition of sulphuric acid, a process of sulphonization taking place with the production of a compound which contains tumenol sulphon and tumenol sulphonic acid. These are separated by processes unnecessary to repeat here, and it is the aqueous solution of the latter substance with which Neisser has experimented. He has used it in the form of solution in sulphuric ether and alcohol, as a powder, ointment, or plaster, and has found it beneficial in acute weeping eczema, erythematous and bullous burns, paresthesia, and superficial or deep ulceration. Sodium combines with tumenol to form sodium tumenol sulphate. It is a dark-colored powder, which is soluble in water, and is used for the same purposes as the preceding.

**Phosphorus and its Preparations.**—Phosphorus has a special action in cutaneous diseases depending upon nerve-debility. It has been followed by benefit in psoriasis, eczema, lichen planus, lupus, herpes zoster, and pemphigus, due to the above condition; also in the later stages of dermatitis herpetiformis. Piffard recommends it in large doses to promote the rash in exanthematous diseases. The dose is from one-twelfth to one one-hundredth of a grain dissolved in almond or sweet oil, or given as a pill. Instead of phosphorus, the phosphide of zinc is frequently prescribed in form of pill in one-thirtieth to one-fiftieth of a grain. The best preparations of phosphorus are the syrup of lacto-phosphate of lime, the compound syrup of the phosphates, and the syrup of the hypophosphites. The yelk of eggs is rich in phosphorized fat or lecithin. These compounds are especially serviceable in eczema of children depending upon malnutrition, also in boils, carbuncles, and some cases of papular and pustular acne.

**Vegetable Alteratives.**—The vegetable alteratives are specially valuable in very many diseases of the skin. The preparations of sarsaparilla have long been known to have good alterative action in chronic syphilis, acne, psoriasis, and in other diseases of the skin. Guaiacum preparations have been employed with advantages in chronic eczema, psoriasis, and syphilis.

Xanthoxylum, or prickly ash bark, is a good alterative aromatic bitter, diaphoretic, diuretic, and sialagogue. It is suitable in many chronic skin diseases in the form of the tincture, especially in acne, rosacea, eczema, and seborrhea.

Stillingia, or queen's root, given in the form of the tincture or the official fluid extract, in doses of from 0.60 to 4 c.cm., or *m* x to fʒj, is an invaluable alterative in chronic syphilis, acne, eczema, and psoriasis.

**Purgatives.**—In the treatment of most diseases of the skin, either at the beginning of the case or at a later stage, purgatives will be found to play an important part. It is very common to find a sluggish constipated condition of the bowels, especially in acne of the face, erythema, rosacea, and in eczema. In eczema of infants, the systematic use of purgatives, and particularly small quantities of mercurials, is an indispensable adjunct to the local treatment. In fact, it is the duty of the physician to inspect the patient's tongue, in the formal examination of a case of chronic skin disease, and to inquire with regard to the action of the bowels, and especially of the liver, just as much as it is in the case of other systematic disorders.

Among the laxatives are the salines, the sulphates of magnesia and of soda, the citrates of the same bases, the tartrate of sodium and potassium, the phosphate of sodium and calcined magnesia. The natural cathartic waters, such as Congress, Hathorn or Hunyadi, Kissingen, and Carlsbad, are extensively used in dermatology. Among the laxative remedies are senna, manna, figs, sulphur, olive oil, cascara, hyoscyamus, prunes, and hard, white soap.

The purgatives proper cause semi-liquid motions, and are useful in overcoming a constipated habit. Among these are castor oil, senna, aloes, rhubarb, and taraxacum. The mercurial purgatives are used not only in cases of specific syphilitic lesions, but also in many chronic conditions attended by deficient excretory action of the liver and intestinal glands. Calomel is the type of this class. It is used most frequently because most conveniently administered in the form of calomel (gr. $\frac{1}{10}$), with a little bicarbonate of soda (gr. $\frac{1}{4}$) and some white sugar.

The drastic cathartics are seldom required in the therapy of skin diseases. They have, however, a strongly irritant action upon the intestinal mucosa, and occasion free transudation of fluids, which make them of value in cases of local edema or acute inflammation tending to suppuration and leucocytosis. Examples of these are jalap, colocynth, gamboge, scammony, elaterium, podophyllum, and croton oil. Large doses of the simple purgatives have a similar action. The hydragogue purgatives are distinguished from the other drastic cathartics by the large watery motions which they produce. Elaterium and croton oil, which represent this class, have a very limited field in dermatology. They afford a means, however, of reducing the volume of blood in the vessels without the sacrifice of the blood-corpuscles, and are useful in relieving congestive conditions and general plethora.

There is no other class of purgatives so generally useful in treating diseases of the skin than those known as cholagogues. The liver is the most active agency in removing organic poisons, toxins, alkaloids, etc., from the blood. Many of the chronic forms of skin disorder are caused by the presence in the blood of excrementitious substances, or the products of fermentation in the intestinal tract. In these the happiest effect often follows the administration of aloes, euonymin, iridin, rhubarb, leptandra, podophyllum, or a suitable mercurial, such as calomel, blue pill, or mercury with chalk. This method of eliminative and antiseptic treatment I consider of primary importance in many, and constantly refer to in the discussion of my clinical cases.

**Diaphoretics** of the first class directly increase the activity of the sweat glands, especially when these are deficient in function. Among the prominent examples of this class are sulphur, guaiacum, sarsaparilla, serpentaria, mezereum, camphor, chamomile, especially when swallowed with hot water. A second class of diaphoretics produces this effect, indirectly, by causing relaxation of the cutaneous vessels and depressing the vasomotor nerves. This class is represented by the nauseating emetics, especially when they produce free vomiting. Among these are tartar emetic, ipecacuanha, lobelia, opium (Dover's powder), ether, and alcohol. A third class acts directly upon the sweat centres in the medulla oblongata: examples of which are pilocarpine, veratrum, and some of the potassium salts. Members of this class of agents, especially when given with diuretics, are very useful in producing elimination of waste products of metabolism, leucomaines, and toxins from the blood. In many forms of skin disease (especially of the chronic gouty, syphilitic and scrofulous type) it is very important to institute the treatment by a course of diaphoretics and diuretics, with an occasional mercurial purge. In this way the injurious action of the toxins is obviated and a way is opened for the restoration of normal metabolism. Such a course of treatment may be followed by tonics to build up the bodily powers previous to placing the patient upon special treatment, especially by mercury, in case the patient shows that he is in poor physical condition from the action of the syphilitic poison, which is frequently the case when these patients present themselves for treatment.

**Diuretics.**—Diuretics stimulate the secreting cells of the kidneys. The quantity of the urine excreted is increased by agents which raise general or local arterial tension. My own judgment is that the best diuretic in nature is the purest kind of water. Distilled water and the various mineral waters, especially those obtained from a pure source, are good diuretics. Among the stimulating diuretics are cantharides, copaiba, cubebs, colchicum, squills, scoparius, juniper, potassium acetate, and calomel. Alcohol, digitalis, belladonna, and nux vomica are valuable diuretics, by elevating blood-pressure. Diuretics are most useful when the urine is of high density and scanty in its quantity. In febrile cases the use of sweet spirit of nitre, solution of acetate of ammonium, and citrate of potassium, not only increase the flow of urine, but they also act as refrigerants and sedatives to the circulation.

**Turpentine.**—As a diuretic and stimulant for diseases of the skin, clinical experience has demonstrated that turpentine is a valuable remedy both in its direct and indirect action. In moderate doses it stimulates the vasomotor nervous system, leading to an increase, followed by a diminution of the capillary circulation. This important action of turpentine renders it one of the most useful drugs in lessening inflammation in psoriasis and eczema, attended with much dilatation of the arterioles and thickening of the skin. Crocker[1] reports very good results from its employment in the diseases just named; using the official rectified oil in doses of from ten to forty minims, three times daily after meals. Barley water, usually about a quart a day, is recommended from the beginning of the treatment, to avoid irritation of the urinary organs. The Chian turpentine in from five to fifteen grains was followed by improvement in pityriasis rubra. Gould also reported, through Crocker, good results from the latter preparation in a case of epithelioma and scirrhus; the pain in both was lessened and the growth retarded. Benefit has resulted in my experience in chronic psoriasis, eczema, and purpura from the use of both the oil and the Venice turpentine.

**Anhydrotics** diminish the activity of the sweat glands in the skin. Generally they produce this effect when swallowed, and likewise when applied locally. This class of drugs is used in cases of excessive sweat-secretion, whether local or general. The principal anhydrotics employed in dermatology are belladonna, atropine, camphoric acid, physostigmine, agaricin, adrenalin hydrochloride, and the mineral acids. The application of solutions, especially alcoholic containing alum, borate of sodium, tannin, or similar astringent agents, is also effective in reducing sweating when it is excessive. Hygienic measures are useful adjuncts especially cold sponging of the surface.

**Anesthetics.**—Applications can be made to the skin for the purpose of benumbing or suspending the action of the sensory nerves, either to allay great local irritation from disease, or to avoid pain in minor operations. Rhigolene has been specially recommended by Richardson for its local anesthetic action. In burns, he relieved rapidly the pain by applying on cotton-wool a combination consisting of camphor and spermaceti, each one drachm, mixed in two ounces of rhigolene. The rhigolene spray may be successfully used prior to opening abscesses, boils, carbuncles, and in operations upon in-growing nails. Chloroform and ether, applied to the skin act as local anesthetics. The former can be brushed over the surface with lint, and often relieves the intolerable itching of some of the neuroses, as for instance in paresthesia; and it is also useful for the same effect in urticaria. Ether is better employed with a spray, and is applicable in operations on the integument. Ice applied for some time to the skin, or cold lotions, will produce an anesthetic action similar to ether. Veratrine ointment, thirty to sixty grains to the ounce of lard, often benumbs the sensibility of the skin. Tincture of aconite has a similar effect.

Another valuable local anesthetic is cocaine hydrochloride in the form of a lotion or injected under the integument. Upon the unbroken skin, it produces little or no impression, but upon a denuded surface, in from a two to a five per cent. solution, it has a decided analgesic effect. In most cases the injection of a cocaine solution into, instead of beneath, the skin causes local anesthesia with less danger of systemic effects. This mode of application has been developed by Schleich, who has demonstrated that anesthesia may be produced by quantities far less than had been hitherto employed. The fluid should be of a low temperature. The anesthesia depends upon the local anemia and the compression. The entrance of the fluid causes a local edema, and when this is complete anesthesia begins. According to the painfulness of the part, Schleich employs a fluid containing from one-sixth grain to three grains of cocaine hydrochloride, one-twelfth to one-half grain of morphine hydrochloride, and three grains of sodium chloride, to three ounces of distilled water. Of this dilute solution, a number of injections are made into the substance of the skin, along the line of incision. It has been found that ten syringefuls suffice for most operations, which is much less than that required by the subcutaneous administration. Schleich's method has been amply tested and proved efficient. In place of cocaine other similar compounds, as anesthesine, eucaine and holocaine, have been similarly used for the purpose of producing local anesthesia.

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[1] "On the Internal Administration of Turpentine in Cutaneous Diseases." Read before the Hunterian Society, London, January 14, 1886.

Local anesthesia may be produced by the method of Schleich for the relief of neuralgia as well as to produce local insensibility for surgical operations. In relieving the pain of cancer and other ulcerating diseases this method of hypodermic injection has proved itself to be very useful. The application of a spray of chloride of ethyl causes local refrigeration and anesthesia. These agents are very useful adjuncts when small growths or tumors of the skin or moles are to be removed, or when the cautery is to be applied, abscesses are to be opened, or foreign bodies removed from the soft parts, requiring an incision of the skin. Freezing of the lesion of lupus vulgaris has been recommended as one of the methods of treatment; but the results have not been as successful as other means now employed. The reports from the application of liquid air in lupus, and other skin diseases, such as varicose ulcers, chancroids, and some other ulcers have been very favorable, as the agent relieves pain and stimulates granulation. Cold is well known as a pain relieving agent when applied in the form of ice-bags, or of coiled rubber tubing.

The exposure of the entire body surface to cold air checks the development of skin eruptions in the specific fevers, and may be used with advantage in smallpox and measles, if the eruption tends to become confluent. It also relieves the annoying itching in this disease.

Some of the more frequently used sedatives are lead water and laudanum, the tincture of aconite with chloroform and soap liniment, belladonna ointment or plaster, opium or morphine preparations.

Phenol and creosote in weak solutions are also pronounced anesthetics. The injection beneath, or into the skin, of three-fourths of a grain of guaiacol dissolved in olive-oil produces complete local anesthesia. Alcohol, menthol, tincture of aconite, and the ointment of aconitine are useful; the latter should be applied with caution.

Poultices of starch, bread, or linseed meal, may have a few drops of laudanum poured over their surface before application, so as to increase the sedative and anodyne effects.

In cases suffering with burns, or extremely painful varicose ulcers of the legs, or carcinoma, relief might be afforded by the expedient suggested by Metzler, of injecting a solution of magnesium sulphate into the lumbar region of the spinal canal. The injection was of the strength of 1 c.cm. of a 25 per cent. solution, for each twenty pounds of the weight of the patient. It was followed by complete insensibility of the lower half of the body, lasting from 8 to 24 hours. Magnesium may also be applied locally for anesthesia in the form of a solution.

**Liquid Air** is also a good anesthetic. The intense cold produced by liquid air renders it an efficient local anesthetic in herpes zoster, dermatalgia, and other painful affections, as well as in the operations of minor surgery. It relieves pain, stimulates granulations, promotes healing in lupus erythematosus and varicose ulcers, limits suppuration in furuncle, carbuncle, and bubo, and has caused improvement in lupus and epithelioma. Liquid air has been generally applied in the form of a spray. On account of its rapid evaporation, the difficulty in handling it, and its comparatively high cost, it has not been much employed in skin diseases, but undoubtedly has active therapeutic power.

**Local Sedatives** are employed to diminish nervous and vascular excitement of the part to which they are applied. They relieve local inflammation and pain. The principal local sedatives are bismuth salts, lead acetate, aconite, cocaine, opium, and belladonna. Sodium bicarbonate in solution, is very useful in treating burns, acute eczema, and poisoning by Rhus toxicodendron. Phenol solutions (3 to 5 per cent.) are useful in relieving pain and itching, especially frost bites and chilblains. Phenol should not be applied upon compresses to the hands or feet because even in weak solutions it produces local asphyxia of the fingers and toes followed by sloughing and gangrene. It should not be applied freely to the surface of the skin in children or injected into the bowel in the treatment of ascarides, as phenol-poisoning with serious consequences may follow.

**Antiseptics** act upon pathogenic micro-organisms, so as to prevent growth and multiplication and thus protect the system against infection. The most important antiseptics are: mercuric chloride, iodine, formaldehyde, phenol, creosote, salicylic acid, chlorine, naphthol, resorcin, aqua hydrogenii dioxidi or solution of hydrogen dioxide. Our therapeutic resources have been greatly enlarged by the introduction of substances belonging to this class, which have the power of destroying the micro-organisms of disease, or of neutralizing their effects. In addition to those diseases which were long ago demonstrated to be due to parasites, we have more lately learned much concerning the part played by microbes in producing numerous other cutaneous maladies. The micro-organisms of suppuration (staphylo- and strepto-coccus), have been found in acne, impetigo, ecthyma, boils, carbuncles, abscesses, sycosis, and the pus of variola. Some diseases, like variola and vaccinia, are of protozoan origin. Another class of diseases, as lupus, scrofuloderma, onychia maligna, and other varieties of local tuberculosis, we now know to depend upon the development of Koch's bacillus. In syphilitic lesions, the spironema pallidum is usually present. Strong reasons exist for the belief that at least certain forms of eczema, purpura in some cases, psoriasis and all of the febrile exanthemata originate from infection. Abraded, excoriated, blistered, or burned surfaces furnish an excellent soil for the growth of bacteria. The problem of topical medication, therefore, is to destroy the bacteria or protozoa *in situ*, or at least to inhibit their further development and prevent the absorption of their poisonous products. These objects are more effectively accomplished when the presence of an open surface allows our remedies to be brought into immediate contact with the pathogenic organisms than when these are protected by an intact epithelium. As, however, in nearly all cases the processes inaugurated by the microscopic pathogenic germs lead to the destruction of tissue, we are often able to shorten the duration of the case by anticipating the course of nature, by the removal of crusts, the erosion of neoplastic deposits, or by the injection of an antiseptic agent directly into the substance of the lesion. In lupus vulgaris, an effective plan consists in destroying the nodules and sprinkling the surface of the artificial ulcer with thymol iodide, betanaphthol, or iodoform, or by applying the same substances in ointment form, or the application of camphorated naphthol, phenol, cresol, or lysol. Prior to softening of the nodule, injections of iodoform, or the introduction of iodine, have been found of advantage. Iodoform in the form of a five per cent. solution in oleic acid, has an excellent effect in preventing the degeneration of enlarged lymphatic glands. The injection of camphorated naphthol has also been followed by good results. Lupus ulcers are benefited, moreover, by the application of salicylated camphor, iodol, iodosulphate of cinchonine, and other antiseptic substances which are mentioned in detail in the section relating to the treatment of that disease. The same substances are available in the management of scrofuloderma. Phenol, salicylic acid, pyoktanin and tincture of iodine are frequently successful in aborting the progress of a boil. Phenol has been the most widely employed for this purpose. It has been made use of in the form of spray, of compresses soaked in a solution of suitable strength and kept in constant contact with the inflamed area; and also by injection into the interior of the boil. Similar procedures have been advantageous in the case of carbuncle, phenol or tincture of iodine being injected into the cribriform openings and pyoktanin, camphor, or iodol, laid upon the surface. Subcutaneous injections of an antiseptic solution, such as phenol, promise well in malignant pustule. The local treatment of erysipelas has been revolutionized. Whereas, a few years since, external remedies were generally looked upon as of slight avail, great stress is now laid upon the use of certain agents, which have shown themselves remarkably efficacious in limiting the extent and severity of the disease. The most valuable of these substances are resorcin, phenol, creosote, creolin, alcohol, corrosive sublimate, salicylic acid and salol. Alkalies are of especial service as pointed out by Laplace. The methods in which they are used are described in the section relating to the treatment of erysipelas. It is of the utmost importance that the surfaces of burns and ulcers should be covered by dressings impregnated with substances able to prevent the activity or to reduce the virulence of microphytes. The local therapy of the pustular diseases of the skin is to be conducted upon analogous principles. The adoption of antiseptic precautions in preparing and preserving vaccine, and in performing the trifling operation of vaccination, has reduced to a remarkable extent the occurrence of those accidents which have sometimes brought undeserved discredit upon the most valuable prophylactic measure known to medical science. In small-pox, decided benefit is obtained by the use of parasiticides in the form of lotions, powders, ointments, or pastes. Suppuration is lessened, the virus weakened or destroyed, fever diminished, and pitting reduced. The severity of scarlatina and other exanthems may be mitigated and their extension restrained by the sedulous adoption of antiseptic measures.

**Aqua Hydrogenii Dioxidi** or solution of **Hydrogen Dioxide** is a very valuable antiseptic. This compound, in the official ten, or more commonly used, fifteen volume solution, is a very efficient oxidizing and antiseptic agent. Its special value consists in its power of decomposing pus. When placed in contact with pus, it causes a frothing with liberation of free oxygen, the cessation of this action indicating that the pathological product has been destroyed. This fluid is a simple, cleanly, and efficacious application to ulcerated surfaces. In many diseases of the skin attended by suppuration and destruction of tissue, lotions of hydrogen dioxide are of decided service, as in the suppurative stage of acne, impetigo, ecthyma, furuncle, carbuncle, and lupus. Properly diluted it may be used to disinfect the surface in confluent small-pox. It is beneficial in acute eczema, although the solution needs to be considerably weakened. Applied by means of a camel's-hair brush, it has given good results in chloasma. Disinfection of the throat and nose is accomplished in scarlatina by a spray of hydrogen dioxide. In paresthesia of the female genitals this agent is advantageously employed as a vaginal injection consisting of one part to three of water. A spray is found a remarkably beneficial application to the surface stung by insects. Unna has found it useful in the treatment of comedones. For application as a spray to the air passages it may be diluted with an alkaline solution such as the official liquor antisepticus, or Dobell's solution. There is often an acid reaction which is irritating to mucous membranes which should be neutralized at the time of using. Solution of hydrogen dioxide is a valuable styptic to oozing surfaces or slight cuts of the skin.

**Thiosinamin** or **allyl-sulphocarbamid** is another very good antiseptic. It is made by heating together allyl-mustard oil (2 parts); absolute alcohol (1 part); and solution of ammonia (7 parts). It is a white crystalline substance with a slight aromatic odor soluble in alcohol (1 to 5), and ether, but is decomposed by water. When injected under the skin it promotes absorption of exudations and of scar-tissue. Thiosinamin has been used by Hebra in the treatment of lupus in doses of 1 to 5 c.cm. (or mxv-lxxv), of a five per cent. solution, injected twice weekly, under the skin in the scapular region alternately on the two sides. It causes a local reaction of the lupus lesions, manifested by swelling for four or five hours this gradually subsides in twenty-four hours. No constitutional symptoms occur; but lupous nodules recede, ulcers become clean, elevated edges are leveled, and cicatrization takes place in a few weeks. It has been found serviceable in rhinoscleroma. It is especially serviceable in inoperable tumors, cicatrices, and keloid. It is also useful in scrofulous lesions and corneal opacities.

**Salicylic Acid.**—This not only is antiseptic, but also has the power of softening the epiderm. It likewise allays pruritus. Salicylic acid is serviceable in chronic eczema, psoriasis, bromidrosis, sloughing wounds or ulcers, and in open cancer. In tinea versicolor and tinea trichophytina it may be applied with benefit. Salicylic acid removes freckles and is sometimes of benefit in lupus vulgaris. It may be used as a powder, ointment, dissolved in collodion, or mixed with gelatin and glycerin. The powder requires, as a rule, to be considerably diluted with rice, chalk, talc, or other inert substance. The ointment may be made to contain from five to sixty grains to the ounce.

**Phenyl Salicylate** or **Salol** is likewise an excellent application to chancroids, chancres, ulcers, wounds, burns, impetigo, and eczema pustulosum. It is decomposed by alkalies into salicylic acid and phenyl. It is generally employed as a dusting-powder diluted with starch.

**Phenol.—Acidum Carbolicum.**—Carbolic acid possesses several official preparations. It is an antiseptic, deodorant, stimulant, anesthetic and mild caustic. Pure carbolic acid or phenol can be administered in doses of 0.03 to 0.13 Gm. (or gr. ss to ii). It is given sometimes as an intern antiseptic in some chronic skin diseases, especially in eczema psoriasis; but it is chiefly used externally for its antiseptic action upon the lower forms of life. Phenol is of especial value in its destructive effect upon old granulations in ulcers, lupus and malignant growths. Diluted phenol is of much value in the itching attending many diseases of the skin. It is of great benefit in eczema, psoriasis, dermatitis, erythema and in the various parasitic diseases used in the form of a lotion or in an ointment.

**Creosotum.**—Creosote, and more particularly that made from beech wood which is of a reddish amber color, can be used as an antiseptic internally and externally. The official preparations are carbonate of guaiacol, dose 0.13 to 1 Gm. (or gr. ii-xv); creosote, dose 0.13 to 1 Gm. (or gr. ii-xv); aqua creosoti, creosote water (1 per cent.), dose 2 to 15 c.cm. (or f℥ss to iv).

Creosote, in addition to being a good antiseptic has sedative action both within and without. The internal administration of creosote is of great benefit in chronic skin diseases, especially lupus, acne, rosacea, eczema and in psoriasis. It is rapidly eliminated by all mucous membranes, especially by the bronchial tract. Creosote has a decidedly good effect upon all the glandular structures both in the body and upon the skin. Creosote used locally and well diluted has both a sedative and an anesthetic action upon all inflammatory diseases of the skin. Creosote employed in a lotion, ointment, or mixed in a powder is of great service in acute eczema, psoriasis, erythema, acne, rosacea, burns and chilblains.

**Resorcinol** acts as an antipyretic internally and as an antiseptic externally. It can be given in doses of 0.32 to 4 Gm. or gr. v. to ℥i. It reduces temperature often in from two to three hours, but may cause from internal use dangerous symptoms. Resorcin may develop by internal use nausea, languor, free perspiration, failure of respiration and death.

This agent is frequently of utility in benefiting the skin or leading to a cure of many of its diseases. It can be employed either in the form of a powder, solution, or ointment. Good effect may follow from the application of the powder to ulcers, epithelioma, the open lesions of syphilis, and sloughing wounds. Cases of complete cicatrization of epithelioma by resorcin have been reported by Luciani, Antonio, and Chasseaud. Resorcin destroys the offensive odor of carcinoma, and is a serviceable local remedy in variola, erysipelas, anthrax, psoriasis, and lupus erythematosus. Andeer recommends an ointment of resorcin made with fresh butter as a vehicle, in the strength of one per cent., prepared extemporaneously as used. It is useful in the treatment of children's eruptions, especially the exanthemata. Dr. M. Ihle,[1] of Leipsic, reports that it is especially a good remedy as a disinfectant owing to its power of destroying the germs of disease. He has used it effectively in herpes tonsurans, in parasitic sycosis, and in wounds and ulcers.

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[1] Monatsch. f. pr. Dermat., 12, 1886. Medical and Surgical Reporter, April 17, 1886, p. 501.

He prefers to use it in the form of a paste which I have modified, as follows:

| | |
|---|---|
| ℞ Resorcinolis puri | ʒijss (10.0). |
| Ungt. simplicis | ʒxiij (50.0). |
| Zinci oxidi, | |
| Amyli | āā ʒvj (25.0). |

M. Ft. pasta.

He also suggests the following made of resorcinol, and recommends it spread on a piece of flannel to be used in alopecia areata and seborrhea attended with falling of the hair:

| | |
|---|---|
| ℞ Resorcinolis puri | gr. lxxvij-cliv (5.0-10.0). |
| Ol. ricini | fʒxjss (45.0). |
| Spirit, vini | f℥iv (150.0). |
| Balsami Peruviani | gr. viij (0.5). M. |

Resorcinol is also useful in tinea versicolor and in eczema marginatum. Pointed condylomata may be removed by a salve containing fifty to eighty per cent. of the drug applied daily. Resorcinol may be irritating to the healthy surrounding tissue, which should be protected by collodion or some other means on its application to the diseased part. When fresh it is white in color; after exposure to light and air, it assumes a yellow appearance and is then useless for application.

**Betanaphthol**[1] is probably the most effective of all antiseptic remedies of this group. It is likewise a deodorant, and has a stimulating, followed by some anesthetic action upon the skin. This effect can easily be demonstrated by rubbing the sensitive ends of the fingers through a quantity of betanaphthol for a few moments when a numb feeling will soon be experienced. It also possesses useful detergent and deodorant properties. Scabies, pediculosis, and all animal parasitic diseases are not only relieved by application of lotions or ointments of betanaphthol, but also are frequently cured. It is for these affections the most certain of all the remedies which we possess. Betanaphthol[2] is likewise efficacious in the different forms of tinea. It relieves itching in urticaria, paresthesia, pemphigus, and prurigo, and is of value in the treatment of acne, sycosis, alopecia circumscripta, and both forms of lupus. To wounds, ulcers, chancres, and chancroids this substance is a beneficial application. The fetor of cancer is suppressed by the use of betanaphthol. It may be used in the form of powder, solution, or ointment, according to the nature of the case. Betanaphthol is practically insoluble in water, but dissolves freely in alcohol, ether, chloroform, and fixed oils. Camphorated naphthol, a creamy fluid made by rubbing together one part of betanaphthol and two parts of camphor, is a good antiseptic dressing for wounds and ulcers. Betanaphthol used in the form of a five or twenty per cent. ointment lessens the infiltration and itching of chronic eczema. It produces equally good results in chronic psoriasis. It can also be employed combined with talc, starch, or other powders, in excessive sweating or fetid perspiration in all parts of the body, with the most happy effect. Betanaphthol can be added to ointments in the proportion of one to ten grains to the ounce for the purpose of simply preserving them—as it will for a very long time—from decomposition. Toxic effects will not follow, as I have shown, from either the internal or external use of properly prepared betanaphthol.

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[1] See paper by the author on "Naphthol; its Medicinal Use and Value," in Journal of the American Medical Association, November 3, 1883.

[2] See paper by the author, Therapeutic Gazette, October 15, 1889.

A compound of betanaphthol and mercury has been recommended as an ideal antiseptic, though it does not seem to have made its way into general use. This substance occurs in the form of lemon-yellow crystals or powder, is neutral and odorless, insoluble in the usual solvents. It contains 30.8 per cent. of mercury, and may be applied as an ointment or, rubbed up with white of egg and water, as an emulsion. Betanaphthol mercury is an excellent stimulant to chronic ulcers, abscesses, sinuses, etc. Favorable reports have been made concerning its internal administration in syphilis.

**Antiparasitics** or **Parasiticides** are agents which are used in infectious, and parasitic, skin diseases, for the purpose of destroying the living pathogenic agent. The principal remedies of this group are: sulphur, iodine, mercurial preparations, liquefied phenol and boracic and salicylic acids. Their methods of application are discussed under the treatment of acne, tinea tricophytina, tinea favosa, tinea versicolor, scabies, phthiriasis, etc.

In actinomycosis, the iodide of potassium has been found to be the best parasiticide agent, when used both locally, by injection, and by the mouth. Quinine is a valuable antiparasitic especially in treating all malarial manifestations, among which are some forms of skin disease. Powdered cinchona bark is a good application to old ulcers. Salicin and the salicylates are useful when used externally and internally, in treating rheumatic lesions when manifested upon the skin.

Local applications of parasiticide agents are often required. Corrosive sublimate is no doubt one of the very best. The action of corrosive sublimate is greatly increased when combined with tartaric or other acid. Dr. Ernest Laplace recommends: mercuric sublimate, 1 part; hydrochloric acid, 5 parts; water, q. s. ad 1,000 parts. This may be further diluted if desired. Thymol is useful in so called ground itch, which is the local dermatitis caused by the hook-worm. Various parasiticides are used, in the several forms of ringworm, "Dhobie" itch and favus. Scabies can only be cured by agents like sulphur ointment, chlorinated oil and balsam of pine, which destroy the itch insect. Parasites upon the surface of the body can usually be banished by cleanliness of the person, but their removal may be hastened by mercurial applications (bichloride solution or white precipitate and blue ointment). Lice are destroyed by tincture of staphisagria, oil of sassafras, etc. The sulphite of soda in solution or the ointment of oleate of copper will generally destroy vegetable parasitic growths upon the skin, like tinea or pityriasis versicolor. The form known as intertrigo, or erythema, caused by the bacillus minutissimum may be overcome by frequent bathing and free use of powdered talcum as a dusting-powder, to which boric acid may be added.

**Disinfectants** are used for the purpose of destroying the organic germs of diseases as they may exist in the atmosphere, water, clothing and pathological discharges. The chief disinfectants are a high degree of heat, formaldehyde, sulphur, sulphurous acid gas, chlorine, bromine, zinc chloride and mercuric chloride.

**Irritants** are applied to the skin for the purpose of exciting local reaction, attended by increase of nervous tension. They cause an influx of a quantity of arterial blood in the vessels, and more rapid local metabolism. In paresthesia, analgesia, or neuralgia of the skin, rubefacients are of great service. The simplest agent of this kind is the hot water bag. Mustard and hot-water local baths, sinapisms, and compresses of flannel wrung out of hot water, (on which a little ground mustard may be sprinkled, or a few drops of oil of turpentine), are also convenient methods of causing local irritation. Chronic eczema with thickened integument is treated successfully by Hebra's method, of rubbing the lesions with a piece of flannel moistened with liquid soap (sapo mollis, green soap), or preferably with the official liniment of soft soap. Soap liniment, which contains camphor, is useful in cases of rheumatic or neuralgic character affecting the deeper layers of the skin; it is to be applied with friction or massage, once or twice daily. It may be beneficially combined with chloroform liniment. Sulphur ointment often causes irritation of the skin when used in treatment of scabies, but this action is unnecessary, since it kills the itch-mite mechanically by filling its spiracles with fat so as to exclude the air. Other ointments may accomplish the same object without causing irritation. On the other hand, irritants may be useful in the treatment of some vegetable parasitic diseases, such as kerion and alopecia. In the latter the application of liquid phenol, or of lactic acid (25 per cent., with castor oil 25 per cent. and alcohol 50 per cent.) is often very effective. In lepra tuberosa, the persistent use of irritants is of marked benefit. The irritants may be applied in concentrated form so as to cause vesication, or even pustulation. Even when the action is less intense there is frequently caused an exfoliation of the skin over the area treated. This is especially observed after the use of iodine as an irritant. Solutions of mercuric chloride cause destruction of the superficial layer of the epidermis. utilized in treating lentigo, or freckles, and also in removing t or particles of coal dust or of gun powder embedded in the skin. Local blistering may be readily and painlessly produced by application of blistering collodion to the selected area. This may also be accomplished by inverting over the spot a thimble containing absorbent cotton moistened with a few drops of strong water of ammonia.

The rubefacient irritants most used are mustard, capsicum, arnica, chrysarobin, turpentine, chloroform, ether and iodine. The vesicants are ammonia, cantharides, euphorbium, mezereum, and iodine. The pustulants are tartar emetic, croton oil and silver nitrate; mustard if applied to the skin for too long a time also may cause pustulation or even sloughing.

**Pix Liquida.**—Tar is a liquid empyreumatic oleoresin: a product obtained by destructive distillation from the wood of pinus palustris and other species of pinus of Europe and America. The official preparations are syrupus picis liquidæ, syrup of tar, dose from 4 to 7.5 c.cm. (or f℥i to f℥ii); oleum picis liquidæ, oil of tar; unguentum picis liquidæ, tar ointment (U. S. P. contains 50 per cent. of tar).

Tar may produce irritation when administered internally. It has likewise stimulating and antiseptic action both within and without. Tar is often used with benefit in cases in which stimulation of the mucous membranes are demanded in chronic skin diseases.

The chief use of tar is for local application in order to stimulate and irritate the skin to a renewed activity. It has been employed with decided effect in chronic psoriasis, eczema, lichen, scabies, sycosis, pemphigus and in lupus and prurigo. It must be born in mind that tar is a stimulant and irritant and should only be employed in chronic diseases of the skin. Some subjects do not bear well the administration or the applications of tar. The pernicious effects of tar are loss of appetite, impaired digestion, vomiting, headache, depressed action of the heart. Taylor mentions a case with fatal results after taking accidentally a large quantity of oil of tar. From the administration or the external use of tar the irritating action may be so great as to develop erythema, papules and vesicles.

**Chrysarobinum.**—This substance is of an orange-yellow color, free from odor, insoluble in water and alcohol, soluble in ether and alkaline solutions. Chrysarobin ointment is decidedly irritant, and communicates a stain to skin and clothing. Chrysarobin excites conjunctivitis if brought into contact with the eye. It is principally employed in psoriasis, in which it is one of our most efficient local remedies. The official ointment is too strong for general use. Chrysarobin is useful in chronic eczema, lupus vulgaris, rosacea, and tinea trichophytosis. It has been used successfully in scabies (gr. xxx to the ounce of lard); but is generally too irritating to use for this disease. Euroben or chrysarobin tannate, soluble in acetone, chloroform and ether, is used as a substitute for chrysarobin, especially as a skin varnish for scaly eruptions.

**Anthrarobinum.**—A compound related to chrysarobin and known as anthrarobin has been introduced as a substitute for the former substance. Anthrarobin has been used locally with success. in psoriasis, chronic eczema, tinea versicolor, and tinea tonsurans in the form of a ten per cent. ointment or solution in alcohol. These preparations should be made fresh at least once a week.

**Caustics** or **escharotics** are sometimes employed in dermatotherapy to destroy or devitalize tissue. The galvano-cautery and the actual cautery may be used to check morbid action, as in hospital gangrene, phagedena, lupus, or cancer of the skin, when ulcerating. Infected wounds, by bites of rabid animals, other virulent lesions, may be destroyed in this way.

**Chemical Caustics and Escharotics** are less penetrating than those just named. These agents destroy the tissue with which they come in contact, mainly by abstracting moisture from it. The mineral acids, particularly nitric, hydrochloric, and sulphuric, are generally used, and are very certain in their action on venereal sores, warts, and indolent ulcers. The acid nitrate of mercury is especially valuable for application to all venereal growths. It should be diluted ten or twenty times before using, and should be applied carefully, or sloughing and salivation may follow. The painful effect of nitric acid is said to be lessened by saturating a small quantity of it with hydrochloride of cocaine preparatory to applying it to the skin. Chromic acid is also a caustic which has a mild but useful action in growths on mucous surfaces, and is serviceable in ulcerations of the tongue, the buccal cavity, and other mucous outlets. Lactic and glacial acetic acids have recently been employed with good results in epitheliomatous, tuberculous, and other morbid growths. Probably one of the most effective of all caustics used at this time is ethylate of sodium. It has a deep and penetrating action, abstracting rapidly the water from the tissues, especially if the surface to which it is applied has been denuded. It is beneficial in lupus, epithelioma, vascular nevi, and in various ulcers. Caustic potash in the solid form, or as a solution, is endowed with powerful destructive action, and should be applied with caution. It can be used either alone or in combination with lime or other substances. The chlorides of zinc and of arsenic are efficient escharotics which may be employed alone or mixed with other remedies to form very active caustic pastes. They both are very painful but are effective when carefully applied, in lupus, the various forms of cancer, and in old ulcers. The great advantage of arsenic, however—which can be used either as a powder or added to some fatty base—is its property of acting upon morbid in preference to healthy tissue. It has the disadvantage of sometimes acting slowly. It also may be absorbed and produce systemic poisoning. There are a number of agents which are to be recommended for superficial caustic effect, such as sapo viridis, the mercurials, especially the corrosive chloride, acetate and sulphate of zinc, acetic acid, strong soluti of ammonia, blistering collodion, iodine, and phenol. The external layer of the skin, the epidermis, when necessary, may be destroyed by one or the other of the last-named remedies. A blister is produced when an effusion of serum takes place, in the deeper layer of the epidermis and lifts it up from the derma, or separates the lower layers of the cuticle.

As a caustic, the chloride of antimony in solution (30 per cent. with 16 per cent. of free hydrochloric acid) has been used successfully as a local application for lupus vulgaris, by Unna. It does not produce a strongly caustic or escharotic effect, unless the solution be continuously applied. It appears to have an affinity for the tuberculosis nodules, causing them to disappear. The solid chloride of antimony, or butter of antimony, has been applied, by means of a glass rod to the lesions of psoriasis.

**Abrus.**[1]—Jequirity, vegetable bean, when properly perpared, has a powerful irritant or caustic action upon morbid conditions of the skin. I herewith give my method: Two hundred grains of the bean are decorticated by being slightly bruised and cracked in a mortar; the red hulls are then carefully picked from the cotyledons, placed in a bottle, and covered with water. They are thus macerated for twenty-four hours, after which they are again transferred to a mortar and thoroughly triturated until they are reduced to a smooth paste, when sufficient water is added to make the whole weigh eight hundred grains. Prepared in this manner, the product has the appearance of an emulsion, and can be easily applied to the diseased surface. It is painless on application, but very soon sets up irritation and severe local inflammation, and at times some systemic symptoms, as headache, pains through the body, elevated temperature, and high pulse. In from twelve to forty-eight hours the inflammatory action becomes most abundant. A cuirass-like crust soon forms, followed by a free flow of pus. In the course of five or six days the discharge lessens, the crusts may become gradually detached, or can be removed by suitable dressings, exposing a surface studded with healthy granulations which before the application may have been the seat of exuberant ones. The virtue of the remedy is in its power to destroy the latter. I have therefore found it to be of the utmost value in specific ulcerations, indolent, scrofulous, and epithelial ulcers, and in ulcerating lupus. In truth, it is a powerful remedy in unhealthy and granulating surfaces, on which it exercises a destructive change, and favors the development rapidly of healthy tissue. Owing to the acute erythematous inflammation and the constitutional symptoms which it occasions, it should be applied with caution in weak and irritable patients.

**Emollients** are agents of a bland and soothing character, which protect the skin surface from the air and from friction. They also diminish tension and relieve pain. The fats and oils are the chief representatives of this class, such as lard, wool-fat, olive oil, spermaceti, the stearates and oleates, glycerin, and cacao butter. Starch, either used as a dusting-powder or as a jelly, is a very useful emollient. It may be used as an ointment in certain forms of skin irritation, or eczema.

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[1] "Jequirity; its Use in Diseases of the Skin," by the author. See Transactions of the Medical Society of the State of Pennsylvania, vol. [illegible] 259-267.

## VACCINATION AND INOCULATION METHODS.

**Vaccination.**—The practice of using calf-vaccine to protect against the small-pox is now almost universal. It has some well-recognized relations to other eruptions on the skin. As a general rule, when there is a decided eruption of eczema, or impetigo, on a child, this is likely to be aggravated and made worse by vaccination. The practice is that the eruption should first be treated and removed before vaccination is done. On the other hand, small blemishes in the skin, like nevi materni, may be removed by vaccination. On some chronic skin diseases of a scaly character, vaccination may have a beneficial effect.

THE OPSONIC TREATMENT, which is designed to increase the resisting power of the body against infectious diseases, is now on trial.

The opsonins are hypothetical substances in the blood-serum which unite with the invading disease germs and make them more inviting to the phagocytes, whose work is to consume them.

Opsonins are present, as the rule, in all normal blood. The disease-resisting power of a man depends upon their presence. If opsonins are present in insufficient numbers, the leucocytes are torpid, phagocytosis lags, and disease establishes itself. This at once suggests the theory that if it be possible to increase the proportion of opsonins in the blood, the natural forces will suffice to resist the ravages of the destructive organisms.

Wright and others have shown that opsonins accompany and cling to the organisms whose destruction they encompass—appropriate opsonins to each variety of organisms. That is to say, a patient may have a normal quantity of opsonins necessary to resist tuberculosis, but these will not avail him against a boil if he is deficient in staphylococci opsonins.

Wright was able to prepare vaccines representing many varieties of opsonins. The opsonins of Wright are prepared from cultures taken from the wound, or the discharge of the particular disease under consideration, and often from the patient himself. The opsonins for a disease, the cooked bodies of microbes, which are obtained by sterilizing special cultures; these are used for subcutaneous injection, as a vaccine. The strength of the inoculation can be adapted to the needs of the patient.

For this purpose due account is taken of what is called the opsonic index. The opsonic index of a given patient is the relation between the number of opsonins present in the blood, and the number present in the blood of a normal person. If a given consumptive patient has only half the opsonins of a normal person, his opsonic index for tuberculosis would be 0.5. This index is far from being constant, owing to the continual efforts of nature to remedy unnatural conditions. The fluctuations are caused by a factor known as auto-inoculation, nature herself inoculating the patient with the poisons derived from the bacteria in the lung.

The efficacy of opsonic treatment depends largely upon the precision of its adaptation to the particular conditions obtaining at the particular times of treatment. In other words, the opsonic index is required to be frequently taken, and the strength of the vaccine calculated with great nicety.

Numerous workers throughout the world are now experimenting with this treatment, with the hope of adapting it to general use, but so far the treatment has been confined to operators who have large experience in bacteriological work, and who have facilities of large laboratories, supplied with elaborate technical apparatus. It may be found to have a limited field of usefulness in certain diseases of the skin.

## HYDRIATIC AND OTHER LOCAL TREATMENT.

The external means which are employed for relieving or curing cutaneous diseases are innumerable. Some have value, while many are useless and hardly worth describing.[1] Among those that have been found most effective are the following:

**Baths.**—Baths are essential for the preservation of health, as well as to prevent and assist in eradicating disease, by carrying away from the system effete products which are often the active factors in many affections of the skin. They not only have this general effect, but by their local action they remove from the skin all abnormal products, such as irritating discharges, scales, crusts, and all extraneous matter. They soften the hardened integument, lessen vascular excitement, relax muscular tension, soothe, astringe, or stimulate the skin, relieve irritation and inflammation, and assist the action of both the constitutional and the additional local treatment to be employed.

Among the various forms of baths that are serviceable are the water, the medicated water, the hot-air, the vapor, simple and medicated, and the electro-vapor bath. Brief reference will be made to these and some others in the following paragraphs.

The water-bath should be composed of soft or rain water, procured from tubs, tanks, or cisterns in which it is caught, or from creeks, rivers, and most springs. Hard water, if possible, should always be avoided, or made soft by adding carbonate of potash or soda in the proportion of one hundred grains of either to the gallon of water, as, owing to the presence especially of lime sulphate in it, the skin, particularly if sensitive, may be irritated or inflamed. The water-bath, if properly used, either cold, tepid, warm, or hot, is often of great value in the inflammatory and hypertrophic affections, as in eczema, psoriasis, pityriasis, dermatitis, and ichthyosis. Hot water baths restore the function of the glands in acne, relieve the abnormal sensibility of dermatalgia and paresthesia, are beneficial in pityriasis, prurigo, pediculosis, and scabies. Warm baths are of service in ecthyma and syphilis.

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[1] Max Joseph in the Deut. med. Woch., May 9, 1907, in a contribution, points out well the elements of the General Treatment of Skin Diseases.

The continued water-bath, recommended by Hebra, so arranged that patients can remain in it for a long time, is useful in the treatment of pemphigus, chronic eczema, psoriasis, and burns.

MEDICATED WATER-BATHS.—These baths generally consist of from twenty to thirty gallons of water, which may be of any temperature, but usually about 90° Fahr. The following are the principal varieties and the formula employed in their preparation:

*Acid Baths.*—Hydrochloric, nitric, or one of the other mineral acids, one ounce added to the bath. Serviceable in prurigo, lichen, and chronic scrofuloderma and syphilis.

*Alkaline Baths.*—Bicarbonate of sodium, or borax, two to ten ounces, but generally about six ounces. Useful in very many varieties of cutaneous diseases attended with irritation of the part, especially in eczema, dermatitis, psoriasis, paresthesia, erythema, urticaria, lichen and prurigo.

*Astringent Baths.*—Alum, from four to six ounces, or a decoction made with half a pound of white-oak bark, added to the usual quantity of water. Used in chronic eruptions, especially in eczema and in purpura.

*Bromine and Iodine Baths.*—The former is prepared by using twenty to forty drops of bromine with two to four ounces of iodide of potassium, and the latter by adding one-half to one drachm of iodine to one or two ounces of liquor potassa and the required quantity of water. Employed in scrofuloderma, syphilis, elephantiasis Arabum, vitiligo, and in excess of pigment.

*Emollient Baths.*—Potato-starch, gelatin, linseed, or marsh-mallow from one to four pounds. They often allay active irritation and inflammation, and can be used in conjunction with the alkaline bath with decided effect. Of value in erythema, eczema, urticaria, dermatitis, herpes and psoriasis.

*Mercurial Baths.*—One-half to two drachms of the corrosive chloride of mercury with a drachm of hydrochloric acid in thirty gallons.

*Potassium Sulphuret Baths.*—From one to six ounces of this salt to each bath.

*The Turkish, or Hot-Air Bath,* as constructed for the Hospital for Diseases of the Skin, in Philadelphia, consists of a closed chamber, six feet square by eight feet in height, provided with ventilators. The heat is carried to it by flues which surround all sides, and thus radiates from parts of the chamber. The temperature is indicated by a thermometer fixed in the room, which can be watched by an attendant from the outside, and is usually maintained at from 130° to 140° Fahr. It may be inconvenient for patients at times to leave their homes to visit an institution for this form of bath. For those so situated the bath can be constructed as follows: The patient is placed in a nude condition on a perforated or cane-bottom chair, and the body from the neck is enveloped in a blanket which goes to the floor, forming a sort of tent. A lighted spirit-lamp or gas stove is then placed beneath the chair. Care being exercised to retain as much as possible of the heated air in contact with the body, free perspiration soon follows, the procedure being continued for from ten to twenty minutes, after which the patient is rubbed dry and placed between warm blankets or sheets. This form of bath is of value in eczema, psoriasis, pityriasis, ichthyosis, and paresthesia. A form of cabinet is now used, which is heated by electricity; a number of electric lamps being disposed around the sides of the box. When desired, colored lights may be substituted for plain ones, for actinic effects. (See page 144.)

*The Vapor-Bath, Simple and Medicated,* is arranged in a similar manner to the hot-air bath; the vapor being conveyed by a series of pipes instead of hot-air flues. The temperature is indicated in the same way, and is maintained at from 115° to 140° Fahr. Given at home, the patient is prepared in the same manner as for the hot-air bath. An ordinary tin pan, or any vessel containing boiling water, is first placed under the chair, and a brick or good-sized stone, previously made very hot, is next carefully deposited in the water, a portion of it may be left uncovered by the fluid, if it be desired to sprinkle over the surface a drug with which to medicate the bath. The vapor quickly ascends, causing copious perspiration, which may be continued from ten to thirty minutes. The patient is afterward treated as after the hot-air bath. If the medicinal substance employed to impregnate the bath is difficult to volatilize, it may be better accomplished by placing a small tray and spirit-lamp beneath the chair; or the drug may be dissolved in water and afterward evaporated by the lamp. The following medicinal agents can be volatilized and used in the quantities named: Mercury and its salts, more particularly calomel or the red sulphide of mercury, from one-half to one drachm; tar, betanaphthol, the balsams, especially Peruvian balsam, one to four drachms; phenol and the essential oils, five to thirty drops; sulphur, from one-half to two ounces. The simple vapor-bath is similar in action to the hot-air bath, with the additional advantages of being slightly stimulating and making the skin more soft and pliable. It is beneficial in acne, eczema, and prurigo, and in all diseases accompanied by heat, dryness, and
of the skin. Of the medicated vapor-baths the mercurial is
syphilitic eruptions, especially when mercury is not well

alimentary canal; the tar and others, in chronic eruptions, particularly in eczema and psoriasis. The sulphur vapor-bath is useful in soothing the irritated surface in obstinate and chronic cases of scabies. Finally, during a vapor-bath, electricity may be brought in contact with the skin, either as the galvanic or faradic current. The so-called electro-vapor bath may give good results in hypertrophies of the skin and in the neuroses, especially in the different forms of paresthesia. It is also very efficient in treating gouty or rheumatic eruptions.

As it has been shown that the water and the medicinal substances contained in baths are absorbed by the skin, some benefit may be expected to result from their specific systemic action. The principal value of baths, however, is in their direct effect upon the skin and their indirect impression upon the system. They should always be used, however, with caution and their effects carefully observed. They should not be given, or persisted in, if contraindicated by any constitutional weakness or disease. With the aged and the very young they should be used carefully. Baths should never be given after a hearty meal or upon a full stomach. The period for continuing in the bath should usually be short, and the bather should also be guided by the temperature of the medium in relation to the heat of the body. The various baths, if used judiciously, are universally acknowledged to be important and useful auxiliaries in the treatment of diseases of the skin.

**Soaps.**—Soaps[1] are useful in assisting to maintain the skin and the body in a healthy condition, and are frequently valuable aids in the treatment of diseases of the integument. They can be employed either as the potash or soft, or the soda or hard soap.

*Soft Soap.*—Sapo mollis, sapo viridis, brown soap, black soap or soft soap contains an excess of alkali. It is made of potash with either an animal fat or a vegetable oil, usually olive oil or cotton-seed oil. The U. S. Pharmacopeia directs that sapo mollis shall be prepared from potash, linseed oil, alcohol and water. When well and properly made it should be of the consistence of jelly and should not flow out if the vessel containing it is inverted. It ought to be of a brownish, greenish, or olive-green color, soft and perfectly homogeneous, with a strong, caustic odor, and an acrid, alkaline taste. It should contain no particles of sand, and should readily dissolve in alcohol with little or no residue. These characteristics will, of course, vary much according to the manner in which the soap is made. The best potash soap, which has a definite strength, is imported from Europe, and obtained from either Duvernois, of Stuttgart, or from Bassermann and Herschel, Mannheim, Germany. Potash soap, when applied to the skin, softens and macerates the epidermis, or even destroys it—the effect on the cutaneous surface varying according to its application lightly or with great friction, as well as to the length of time it is left in contact with the parts. The variable and uncertain effect that occasionally follows its use, denuding the epidermis at one spot and making no impression whatever at another, is due to the soap being neither properly nor well prepared. Potash soap may be used alone or dissolved in alcohol, as recommended by Hebra, in the proportion of two parts of soap to one of alcohol, which will remove its unpleasant smell. To make it more elegant, and free from any particles of sand that may be present, the solution is allowed to settle, or is filtered and scented with the tincture of lavender, and it is then known as spiritus saponatus kalinus, or Hebra's spirit of soap. The official linimentum saponis mollis (U. S. P.) contains green soap (65 parts); oil of lavender (2 parts); alcohol and water (q. s. ad. 100 parts).

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[1] The brief description of soaps is abstracted from my paper "On Soaps, especially Medicated, in Diseases of the Skin." For a detailed account, see Transactions of the Medical Society of Pennsylvania, vol. xvii, pp. 190-205.

*Mollin*,[1] which is a modified soft soap, has been extolled in Germany as a useful vehicle for applying various substances to the skin. As described by Jackson, it is prepared from the best and freshest kidney-fat and suet and the finest Cochin cocoanut oil. The fat is saponified cold with potash and some soda, so that to one hundred parts of fat there are forty parts of lye. Into the mass, thirty per cent. of glycerin is worked, and the whole carefully heated. When properly made, mollin has a pale-white color with a slightly yellow tint, and an agreeable, smooth, soft consistence. It is not essentially affected by exposure to changes of temperature or by being kept in open vessels. It is superior to an ointment in being perfectly clean, not soiling the under-clothing and not becoming rancid, and in being readily removed from the skin by warm or cold water, leaving it soft and smooth.

*Hard Soap*, Sapo (U. S. P.), is generally a nearly neutral soap, made with sodium hydroxide and olive oil. It may also be made with either an animal or mineral fat, or any kind of vegetable oil. From the investigations of Dr. B. H. Paul[2] we learn that perfectly neutral soda soap made with ordinary fat, consisting principally of oleic and stearic acids, contains about eleven parts of soda for every one hundred parts of fatty acid. A neutral soda soap, however, made with cocoanut oil in which palmitic acid preponderates, contains a larger portion of alkali. According to the same writer, the proportions of soda and potash given in the formula for Unna's super-fatted soap suffice for the complete saponification of the fat, though it has been supposed that this preparation contained four per cent. of unsaponified fat.

Hard soap just described differs from the potash soap in being hard, or comparatively so, and in having a less stimulating or destructive action on the skin. If soap be needed, either to cleanse the surface or for its local effect, it is often best to employ first the soda and then subsequently, if desired, the potash soap. The field of usefulness of both may be rendered more extensive and effective by medicating them with such agents as alum, arnica, boro-glyceride, camphor, phenol, cresol, chamomile, ergotin, eucalyptol, naphthol, resorcin, salicylic acid, mercury, sulphur, and tar.

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[1] New York Medical Journal, November 6, 1886.

[2] "Toilet Soap considered from a Chemical Point of View," British Journal of Dermatology, March, 1890.

In making these medicated soaps, chemical requirements must be carefully observed or useless preparations result. It has been stated that soap containing free iodine remains unaltered but a short time. Resorcin can be preserved only in a neutral soap. In a neutral or alkaline soap, hydroxylamine undergoes progressive decomposition, which is evidenced by the continual evolution of gas. Chrysarobin is not soluble in a neutral, but is readily soluble in an alkaline soap. A toilet soap should not contain free alkali, which removes too much of the cutaneous fat and causes premature exfoliation of the corneous epidermic cells. It should be neutral in reaction. P. J. Eichhoff points out that a few drops of a hot solution of mercuric chloride let fall upon the soap will develop a yellowish discoloration if any free alkali be present. Eichhoff describes four methods in which medicated soaps may be used in the treatment of disease: by simple washing; by allowing the lather to remain upon the skin for a short time and then rubbing it off with a dry cloth; by permitting the lather to dry upon the surface; and, finally, which he considers the most effective, by covering the dry lather with an impervious layer of rubber cloth or tissue. He states that resorcin soap may be preserved by the addition of salicylic acid, and he incorporates three parts of each substance in ninety-four parts of soap to form resorcin-salicylic-acid soap. This preparation he finds advantageous in parasitic skin-diseases, especially those in which epithelial hyperplasia is a marked feature, as seborrheic eczema, psoriasis, and ichthyosis. A salicyclic-acid-resorcin-sulphur soap contains three parts each of salicylic acid and resorcin, and ten parts of precipitated sulphur to eighty-four parts of soap. Acne, rosacea, psoriasis, ichthyosis, ringworm, and favus are benefited by this application. The addition of five parts of tar to the preceding soap constitutes his salicylic-acid-resorcin-sulphur-tar soap, which is deleterious in acute inflammations; but is useful in parasitic affections, squamous eczema, and psoriasis. Three per cent. of quinine added to soap is recommended for chromophytosis, used morning and evening and the lather allowed to remain. A soap containing three per cent. of hydroxylamine is serviceable in psoriasis, seborrheal eczema, and tinea sycosis. A five per cent. iodoform soap may be used in cleansing common and syphilitic ulcers. One containing five per cent. of creolin is efficacious in scabies, impetigo contagiosa, intertrigo, hyperidrosis, and bromidrosis Eichhoff employs an ergotin soap of the same strength in the treatment varicose ulcers, frost-bite, and rosacea. A preparation in which three parts of iodine and one and a half parts of iodide of potassium are present is employed to reduce enlarged scrofulous glands, and is of avail in psoriasis. A salicylic-acid-creasote soap, into which enter five per cent. of salicylic acid and two per cent. of pure creosote, is of value in lupus, ringworm, and seborrheic eczema.

**Poultices or Cataplasms.**—Various substances which retain heat and moisture can be used as poultices, such as bread, flaxseed-meal, potato-starch, etc. Water, milk, or some other fluid at the boiling temperature, should always be used in preparing poultices. They should be applied as hot as comfort will permit, and should be covered, if possible, with rubber tissue or oiled silk, to retain the heat and moisture. Cloths dipped in boiling water, partially wrung out, at once applied and covered with oiled silk, make a hot compress or "stupe." A few drops of the oil of turpentine sprinkled over the surface before application will increase the counter-irritant and stimulating effects. The most soothing and most effective of all poultices in cutaneous diseases is composed of starch. It is important, however, that this poultice should be properly made. In the first place, enough tepid water should be mixed with the starch to form a paste. Boiling water should then be added, the mixture left on the fire for about a minute, being briskly stirred to make it homogeneous. It should then be spread upon tarlatan previously deprived of its stiffening. Poultices act very often in a happy manner in dilating vessels, relaxing the muscular tension, and assisting in removing the hard, tense, high inflammation and the sensitive condition of the nerves of the part. In infiltrated and dormant conditions of the integument, they soften and soothe the parts, arouse the absorbents, and assist the action of other local remedies. Poultices relieve pain and promote suppuration in deep inflammation of the integument. They are also of great utility in many affections, particularly for removing scales, crusts, and extraneous matter.

**Dusting-Powders.**—Dusting-powders are employed to protect the skin; and, at times, to produce a soothing, stimulating, or astringent action. The most useful are starch, wheaten and buckwheat flour, corn-starch, orris-root, arrow-root, carbonate of magnesia, carbonate of lead, the impure carbonate of zinc, carbonate of zinc, oxide of zinc, subnitrate of bismuth, lycopodium, boric acid, salicylic acid, alum, French chalk, red cinchona powder, oleate of zinc, talcum and prepared earth. The latter three are especially valuable; the oleate of zinc being particularly effective in many inflammatory cutaneous diseases. Prepared earth—so long and favorably employed by the late Dr. Addinell Hewson in the treatment of old ulcers, epithelioma, small-pox, and many diseases of the skin—has a beneficial effect, not only in relieving but often in absolutely curing the eruption to which it has been applied. Dusting-powders should be carefully prepared. They must be thoroughly ground, and afterward sifted through fine bolting-cloth. It is important that they should be smooth and free from grit. A powder brought into notice by Dr. Allan Jamieson is known as emol-keleet. It is an impalpable, emollient powder, described as containing a considerable proportion of steatite, with silica, alumina, traces of calcium salts, and some ferrous oxide. Emol-keleet is of a light flesh-color, a good absorbent and antipruritic, and is said to have the property of softening horny thickening of the integument. The official talcum powder is very largely used as a protective dusting-powder, to which boric acid is frequently added, with some aromatic to give it an agreeable odor. The prepared talcum of Squibb is one of the best of these preparations for toilet use or as a protective agent in dermatitis.

Dusting-powders, by protecting the skin from the air and all irritating substances which may come in contact with it, and by absorbing the exudation, are of great value in certain stages of erythema, eczema, herpes, herpes zoster, pemphigus, and the various disorders of secretion.

**Lotions.**—Lotions are liquid preparations for external application. They are best adapted for use upon diseases involving a large surface, and where other applications are contraindicated. They constitute a cleanly and economical method of medicating the skin.

Lotions may be prepared with water, alcohol, spirits, glycerin, oils, and other fluid substances, and may be divided into those which are sedative, astringent, and stimulating. When made with oil or alcohol as a menstruum, they are officially known as *Linimenta*, or liniments. Sir James Sawyer advocates the use of ether as the best menstruum for the solution of many remedies for local action through the skin. It is a good solvent for the active principles of many drugs, and also for the fatty constituents of the sebum.

Sedative lotions diminish or relieve irritability. Among the most valuable are lead-water and laudanum, elder-flower water, camphor-water, black- and yellow-wash, glycerin and rose-water, glycerin and lime-water, glycerole of lead, weak solutions of the alkalies, of boric, hydrocyanic acids, phenol, and of thymol. They are employed in inflammatory diseases, and in neurotic and parasitic affections.

Astringent lotions contract the tissues to which they are applied, lessen or arrest discharge, and moderate or control inflammation. They can be made with one of the fluids already named, and may contain tannic or gallic acid, catechu, ergot, kino, rhatany; the various acids, the preparations of lead, alum, iron, and other drugs, having a similar action.

They are used largely in certain varieties of eczema, purpura, seborrhea oleosa, the disorders of secretion, and in many chronic forms of cutaneous diseases.

Stimulating lotions are irritant in character and arouse the torpid integument to activity. They are prepared with one or more of the following drugs in varying proportions: tar and its products, stimulating oils, alkalies, the preparations of ammonia, benzoic acid, chrysarobin, arnica, rosemary, menthol, thymol, camphor, chloroform, boro-glyceride, sulphur and its preparations, and similar drugs. They are most effective in chronic eczema, psoriasis, acne rosacea, and seborrhea.

**Ointments.**—Ointments may be made from various fatty substances, but lard, butter, suet, wool-fat, spermaceti and petroleum-jelly are usually employed. An ointment may be simple, containing only one of the above materials, or it may be medicated by the addition of various remedies. Simple and medicated ointments are among the most effective means of making an impression upon diseased skin. They are especially useful in chronic disorders and those accompanied by incrustations. In reference to the proper base to employ for ointments, I repeat what is briefly stated in my small book on the oleates: The fatty vehicles intended for ointment bases are a matter of choice according to the indications of the case. While, no doubt, the most elegant preparations can be made with the petroleum fats, they form, in my opinion and in that of others, the least desirable substances for such use. In a paper, read before the Medical Society of the State of Pennsylvania,[1] I stated that I considered the petroleum products as objectionable for such a purpose; and Dr. Robson, of England, has made a similar observation on the use of vaseline as a surgical dressing.[2] I also consider them to possess a feebler penetrative power, than animal fats, which have more affinity for the integument. They usually contain some irritating constituent, which lessens or destroys their emollient action, and constitutes a great hindrance to their use as external remedies especially in active inflammation.

The subsequent investigations of the late Professor Oscar Liebreich fully confirm the conclusions to which I came to some years ago.

He found that: "Quite apart from the fact that the absorption of medicaments, when mixed with pure fat is but imperfectly effected, fat-ointments are subjected to decomposition, which may lead to irritation of the skin. It is true that vaseline does not decompose, but it prevents the entrance of medicaments into the skin, so that even poisonous substances, when mixed with vaseline and rubbed into the skin, produce neither local nor constitutional symptoms of poisoning."

From Liebreich's experiments and conclusions, and my own, the positive conclusion is to be drawn that the preferred substance to employ as a basis for ointments should possess the power of penetrating the integument without irritating it. Lard, suet, and lanolin are all animal fats, which are therefore best adapted for this purpose. Lard is the most economical and the most commonly used; the objection against its quickly becoming rancid can be overcome by prescribing only a sufficient quantity to last a few days, and it rarely undergoes change before it is utilized. The addition of benzoin or a small quantity of betanaphthol will prevent it from becoming rancid for a long time. Digestion with freshly bruised poplar-buds will also accomplish the same purpose. It is sometimes of advantage to stiffen the lard by the addition of white wax, or spermaceti. The latter substance, however, is also prone to become rancid. Suet also forms a valuable ointment, and a serviceable vehicle for the application of many medicinal substances to the skin. Lanolin,[1] or wool-fat, a basis for ointments, introduced by Liebreich in 1886,[2] is one of the most desirable vehicles for limited applications and is now official as adeps lanæ. It is "purified cholesterin fat of sheep's wool." From investigations which I made some years ago, and published in a paper on lanolin,[3] I found that this agent possesses great absorptive action, and through its neutrality, its own decomposition is out of the question, and consequently it will not irritate the skin.

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[1] Transactions of the Medical Society of the State Pennsylvania, vol. xiv, p. 129.

[2] See an article on the "Irritation of the Skin following the A[illegible] Vaseline," in the London Lancet, of November 8, 1884.

Liebreich stated that it has its origin in keratinous tissue. It is manufactured from wool by "transforming the wool-fat into a milk and then subjecting it to a centrifugal action." By this process, "a thin milk and cream are obtained, just as when milk is subjected to centrifugal action, and the cream contains lanolin in a pure condition. More than one hundred per cent. of water can be kneaded with it, the result being a yellow, very plastic ointment." It is neutral in reaction, and has the consistency of ordinary citrine ointment, which it very much resembles in appearance. It is soft, smooth, and slightly tenacious. In order to overcome this stickiness, Mr. H. Helbing has suggested a mixture of sixty-five parts of anhydrous lanolin, thirty parts of liquid paraffine, and five parts of cerasin. The late Professor P. D. Keyser, of this city, with the same object in view, combined one part of benzoinated lard with three parts of lanolin. We may in some cases take advantage of the tenacious consistence of lanolin to render certain ointments stiffer and more adhesive by the addition of about twenty per cent. of this agent. On applying lanolin to the skin with slight friction, it is rapidly absorbed and disappears. Lanolin is decomposed with great difficulty, and it readily combines with other fats, oils, and glycerin, forming many excellent ointments and liniments. Paschkis recommends what he terms "lanolin milk" as an excellent application to dry, harsh skins, and useful, moreover, as covering the skin with a thin layer of fatty material, to which dusting-powders will readily adhere. Lanolin milk is made by rubbing up seventy-five grains of lanolin with a fluid ounce of water, gently warming and adding to the mixture one drachm of neutral soda soap dissolved in an ounce of water. This is again rubbed up, enough warm water added to make twelve fluid ounces, and the whole thoroughly agitated. If desirable, a little tincture of benzoin or borax, dissolved in a small quantity of warm water, may be added. The mixture needs to be strained. Engman has recommended the following cream of wool-fat, or *Cremor Lanolini:*

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[1] The best lanolin is manufactured at Lanolin Works, Martinikenfelde, Germany. Burroughs, Welcome & Co., Snow Hill Buildings, London, are the agents, and have placed before the profession some elegant preparations of this fatty substance.

[2] See Liebreich's paper read before the Section of Therapeutics of the British Medical Association, August, 1886, with discussion by the author, in British Medical Journal, October 17 and 23, 1886.

[3] The Medical and Surgical Reporter, Philadelphia, April 3, 1886.

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| ℞ | Oil of sweet almonds | f℥ viij. |
| | Purified wool-fat | ℥ viij. |
| | Lime water | Oj. |
| | Oil of rose | q. s. |

Melt the lanolin and oil of almonds, and while hot add the lime water and the oil of rose. This should be kept on ice. He also prescribes a cream ointment, *Unguentum Cremor*:

| | | |
|---|---|---|
| ℞ | White wax, | |
| | Spermaceti | āā ℥ j. |
| | Wool-fat | ℥ iv. |
| | Cocoanut oil | ℥ j. |
| | Oil of sweet almonds | ℥ viij. |
| | Tincture of benzoin | ♏ xxx. |
| | Orange flower water | f℥ ij. |

Melt the oil and wax, and while cooling stir in the other ingredients. Keep in the ice-box.

Unna recommends the following as a cooling salve, *Unguentum Refrigerans*:

| | | |
|---|---|---|
| ℞ | Lanolin | 10 parts. |
| | Benzoinated lard | 20 parts. |
| | Water | 30 parts. |

As used in medicine, lanolin contains from twenty-five to thirty per cent. of water, not, however, in a state of chemical combination. Made according to the latest improved processes, the animal odor is almost entirely overcome and the substance is of a whitish color. Lanolin as an excipient for mercury, serves a double purpose. The metal is readily incorporated, and the prolonged manipulations formerly necessary in the preparation of mercurial ointment are now succeeded by a more rapid and easy process. Again, the ready absorbability of lanolin promotes the efficiency of the mercury which it may contain. On account of its miscibility with water, an aqueous solution of any drug may be intimately united with the wool-fat.[1] Lanolin is unaffected by micro-organisms, and is consequently an aseptic material. By virtue of this property, it is well adapted for use in burns, scalds, frost-bites, and erysipelas. Gottstein has taken advantage of its power for absorbing water to incorporate with it aqueous solutions of corrosive sublimate. It thus constitutes an admirable disinfectant application to wounds and ulcers. In the same way it may be impregnated with other medicinal substances. According to the late Professor Lassar, lanolin promotes or intensifies the action of chrysarobin. Lanolin is a valuable unguent in senile atrophy of the skin, ichthyosis, scleroderma, psoriasis, anidrosis, chronic eczema, and impetigo contagiosa. Its penetrative quality renders it an excellent vehicle for germicides, in the treatment of tinea trichophytina; and for mercury when inunction is practiced for syphilis. Lanolin is useful in improving impaired nutrition of the hair and nails. This substance has lately been produced in the form of a powder by the following procedure: The lanolin is dissolved in ether, alcohol, chloroform, or acetone; the solution mixed with magnesia and dried. The mixture is additionally pulverized, and starch can be added in any proportion. Oxide of zinc, talc, alum, or bismuth may be used instead of magnesia. This preparation may be serviceably employed as a dusting-powder. Hallopeau regards lanolin, with a solution of gutta-percha in benzol, as the best plaster constituent which we possess.

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[1] See Ointments and Oleates, especially in "Diseases of the Skin," by the author, second edition, Philadelphia, 1890, F. A. Davis, p. 14 *et seq.* Also his work on "Materia Medica and Therapeutics," seventh edition, 1908.

According to Unna, fats, glycerin, lanolin, and petrolatum diminish the rate of evaporation of water from the skin. Caoutchouc and gutta-percha have the same effect. As a result of diminished transudation, a corresponding quantity of water is driven to the kidneys.

Whenever ointment is prescribed, it is essential that it should be well made, and, particularly, that the ingredients should be thoroughly triturated and intimately mixed with the excipient. Exact directions, moreover, should be given to the patient as to the mode of application. If used at all, it should be in a proper manner. Otherwise, an appropriate preparation may work injury instead of benefit. An ointment generally needs to be kept in constant contact with the affected surface as long as the indications are the same as those which suggested its employment in the first place. As a rule, an abundance of material should be applied, spread thickly upon the wooly side of the lint, which will not absorb the medicament and consequently leave the integument almost or entirely unmedicated. The dressing is then held in position by a bandage.

In regard to the strength of ointments, it is obvious that no absolute rule can be formulated. The skin of individuals differs normally in sensibility, and the difference becomes more marked when the integument is the seat of disease. If the official ointments are used, it will frequently be found that some are too strong, while others are too weak. In beginning the treatment of a case, generally it is advisable to use mild preparations, which can be gradually strengthened if necessary.

Ointments, like lotions, may be sedative, astringent, or stimulating.

*Sedative Ointments.*—Simple ointment, suet, lanolin, unsalted butter, ordinary cerates, spermaceti, cacao-butter, lead, zinc, and cucumber ointments, are examples of this class. They are employed for their bland action in protecting the surfaces, and in soothing and allaying irritation and inflammation in many cutaneous diseases.

The rose-water ointment, or "cold cream," is bland, elegant, and efficient. In certain cases, as Bulkley points out,[1] when the skin is too dry, a portion of the water which this preparation contains may be serviceably replaced by glycerin. Purified wool-fat, or lanolin, also may be added to cold cream, or substituted for the spermaceti in the formula.

*Astringent Ointments.*—Ointments of this class are employed for the purpose of contracting the integument to which they are applied, lessening discharge, and arresting or modifying inflammation. They are composed of lead, bismuth, tannic acid, kino, ergot, and various other astringent substances mixed with a fatty base.

*Stimulating Ointments.*—Ointments containing a stimulating ingredient are to be used in the conditions already alluded to in speaking of stimulating lotions. They are most essential, especially in the subacute and chronic stages of many eruptions. Tar, naphthol, phenol, creosote, thymol, sulphur, the mercurials, chrysarobin and pyrogallic acid, are among some of the most valuable agents which can be used alone or combined for their stimulating action upon the skin. Great precautions must be exercised in employing chrysarobin and pyrogallic acid over a large surface, as severe constitutional symptoms may follow from the application of the latter, especially after extensive use. Biesner and others have reported marked toxic action from its application. Chrysarobin ointment must not be brought into contact with healthy skin, as it may occasion a severe dermatitis. The ointment of pyrogallic acid, if made too strong, may also produce inflammation and even sloughing of tissue, and it should therefore never be spread upon an extensive area of surface.

The petroleum-fats also can be employed for stimulating purposes, providing penetrative action is not desired for any substance which may be mixed with them.

Several new preparations have been introduced with the object of superseding ointments or, in certain particulars, improving the effects of those preparations.

*Bassorin Paste.*—The use of bassorin was first suggested by Dr. Ferdinand Lassar. This is a constituent of various vegetable substances, but that obtained from gum tragacanth was found the most satisfactory in practice. Bassorin is demulcent, tasteless, and odorless. The paste is made by soaking one part of pure bassorin in fifteen parts of water and adding twenty-five per cent. of white dextrin and ten per cent. of glycerin. The paste is of neutral reaction, light yellow in color, smooth, homogeneous, and dries quickly upon the skin. It keeps well, does not stain, is readily removed by water, and adapts itself perfectly to the affected surface. Bassorin paste is rendered too liquid by mixture with fluid preparations, while alcoholic solutions cause it to become hard and brittle. In this country it has been much employed by Dr. George T. Eliot, of New York. Almost any solid substance except tannates and iron compounds can be incorporated with the mass. Bassorin paste is regarded as especially useful when combined with zinc oxide.

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[1] Therapeutic Gazette, August 15, 1891.

*Unguentum Caseini.*—Casein ointment is an unguent base proposed by Unna. It is a mixture of two parts of casein, carefully freed from butter-fat, with one part of glycerin, and three parts of vaselin. The solution of the casein is effected by potash or soda, three per cent. of the weight of the casein in the fixed alkalies being sufficient to make a permanent emulsion of neutral reaction. Acids which coagulate milk can not be used in casein ointment, but slightly acid medicaments may be incorporated. Pulverulent neutral drugs can be added to the paste. The unguent soon dries smoothly when applied, and can be removed at any moment by washing with warm water. Casein ointment is recommended by Unna as a useful application in the pruriginous eczema of childhood, paresthesia, urticaria, rosacea, acne, and other affections. It is also useful as a protective covering to the skin.

*Epidermin.*—This name is given to a base prepared by Dr. S. Kohn by melting half an ounce of white wax and triturating it in a warm mortar with an equal quantity of powdered gum-arabic until a homogeneous paste is produced. To this mass is then added a boiling mixture of half an ounce each of water and glycerin, and the whole is stirred together until cold. Epidermin is a semi-fluid, creamy substance which soon dries upon the skin, forming a tenacious and elastic coating.

**Oleates.**[1]—The history and origin of this class of remedies, which were first pointed out by Attfield and Marshall, together with their process of manufacture, their physiological action, and their therapeutic effect, I have fully considered in my little work devoted to this subject. I never claimed, as has been unjustly charged, that the oleates were original with me. An examination of the various papers I have written, as well as the book just referred to, will clearly show that I make no such pretensions. I do, however, claim that my physiological and therapeutic investigations, as set forth in the contributions referred to, are original.

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[1] Transactions of the Medical Society of the State of Pennsylvania, vol. xii, p. 707. See papers on oleates with discussion, read before the Section of Pharmacology and Therapeutics, at the Fifty-second Annual Meeting of the British Medical Association, in the British Medical Journal, October 18, 1884, pp. 749-754. "The Ol by J. V. Shoemaker, A.M., M.D., Philadelphia, F. A. Davis, 1885. Also the s edition of his "Materia Medica and Therapeutics," Philadelphia, 1908.

The oleates, particularly those of arsenic, copper, lead, mercury, and zinc, are highly valuable remedies. The professed lack of faith in, and condemnation of, them by a few observers are due entirely to the fact that they have been used carelessly, and erroneous conclusions drawn from imperfect experience. The following alphabetical arrangement of the oleates, with description of their therapeutic action, has been extracted from my monograph just referred to.

*Aconitine Oleate.*—Aconitine oleate has a slight local action, its effect is, however, very feeble; it can be used in mild cases of neuralgia, where a weak anesthetic impression is desired.

*Atropine Oleate.*—Atropine oleate has a mild action upon the integument, any toxic effect of the drug being almost impossible, unless it be applied freely over a large surface.

*Aluminum Oleate.*—Aluminum oleate, melted with an equal proportion of lard, or other fatty substance, constitutes the ointment of aluminum oleate. It is serviceable in checking the muco-purulent discharges that occur in dermatitis and in eczema. In hyperidrosis it lessens and frequently removes the excessive secretion, while in bromidrosis the fetid discharge will either be entirely overcome by its use, or very much diminished. It is beneficial as a dressing in foul ulcers, abscesses, sinuses, chilblains, and burns.

*Arsenicum Oleate.*—Arsenicum oleate, melted in the proportion of one part to nine parts of lard as an unguent base, or one part in four, according to the strength desired, forms the ointment of arsenic oleate.

It is both a valuable alterative and an escharotic, but should always be used with caution. Applied to the normal skin, little or no change is produced, but when used moderately strong on abrasions, wounds, and ulcerating and granulating surfaces, it acts as an escharotic, exciting active inflammation, and destroying the tissue to some depth. In ulcerating epithelioma it is one of the very best remedies, by reason of its being better borne for a longer period in its application than any other form of arsenic. In lupus it is especially serviceable, destroying, by its constant use, cell-infiltration in a comparatively mild and painless manner. In old ulcers, especially those of a scrofulous nature, it is of great utility.

*Bismuth Oleate.*—The ointment of bismuth oleate, a pearl-gray, soft, bland substance, possesses an emollient and slightly astringent action, and is useful in soothing and relieving cutaneous irritation. It is a valuable remedy in all pustular eruptions. It allays and often overcomes the high inflammation in erysipelas and sunburn. In acne and rosacea it soothes the hyperemic skin, and relieves the engorgement of the glands, frequently subduing some of the most intractable cases.

*Cadmium Oleate.*—The ointment of cadmium oleate has had as yet but little practical use. It is a very strong stimulant, having an almost caustic action upon the denuded integument, resembling in this respect very much the action of the ointment of nickel oleate. It has been used with some advantage in enlarged glands. It has also been serviceable at times in cases of chronic eczema, with great infiltration, and in exuberant granulations, and old ulcers.

*Cocaine Oleate.*—Cocaine oleate (six per cent. alkaloid) has a slight anesthetic action upon the integument. This decided effect, however, that has been claimed by some from its application to the skin has not been observed in my experience, even after repeated experiments with it in operations on warts, corns, horns, cancer, lupus, and the removal of superfluous hairs.

*Copper Oleate.*—Copper oleate, made with fat or lard, in a twenty or ten per cent. ointment, when applied to the unbroken skin, has no visible effect on the surface, but penetrates deeply into the follicles, causing slight stimulation. The treatment should usually begin with the ten per cent. ointment, which can be gradually made stronger. If brought in contact with the broken skin it has both an astringent and stimulating effect, and an insoluble albuminate is formed which coats over the surface, thus supplying the place of the abraded skin. It condenses the tissues, constringes the blood-vessels, and thus lessens the determination of blood to the part. It acts as an irritant to any delicate surface, causing inflammation and pain. It is a most effective application to arrest bleeding, particularly in irritable sores and indolent ulcers; obstinate granulations will often yield to it. It is an excellent antiseptic, as well as an antiparasitic agent. The most successful results, however, have followed its use upon vegetable parasitic affections, both in my own experience, and in that of Sawyer, Harries,[1] Startin,[2] and Alder Smith.

In tinea versicolor, or chromophytosis, it acts in a decided manner, rapidly removing the parasite from the surface, as well as from the follicles. It is equally effective in favus, which often yields quickly to its application when made with friction, so as to carry the remedy into the deeper layers of the skin and the hair-follicles. In all vegetable parasitic affections to which it is applied, care should be taken to avoid the use of water to the parts, which may prevent the copper oleate from penetrating to the lowest depth of the follicle, and thus interfere with its action on the fungus.

Copper oleate, melted and spread as plaster, will relieve, and very often cure, hard and horny warts, corns, bunions, and thickened conditions of the epidermis to which it is applied. The ointment of copper oleate is a useful remedy for freckles and other yellowish-brown or blackish patches of the skin.

*Iron Oleate.*—Iron oleate is readily soluble in fats. It is a valuable styptic and astringent. In the inflammatory form of eczema, in which the surface has become denuded, red, raw, and bleeding, the application of a weak ointment of iron oleate, or the oleate itself used in other soothing and slightly astringent combinations, will prove of the greatest value, its styptic and astringent action having a very happy effect upon the parts. It has a marked action in pustular eczema, sycosis, furuncles, and in scrofulous ulcers and sinuses. The first and second stages of acne rosacea are promptly benefited and often entirely relieved by its application. The lesions that result from arsenical poisoning, especially the pustules and ulcers, are more benefited by this ointment than by any other remedy that I have used in such conditions.

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[1] British Medical Journal, November 28, 1885.

[2] See an interesting paper on "Oleate of Copper in Ringworm," by James Startin, Surgeon, of England, read before the Willan Society, December, 1884.

*Lead Oleate.*—Lead oleate, melted with equal parts of lard or lard-oil, gives a cream-colored, semi-solid ointment of the consistence of simple cerate. It is more easily and cheaply prepared than either Goulard's cerate, or Hebra's litharge-ointment, or any of the later modifications; it is more readily absorbed, and is superior to all of them.

The ointment of lead oleate, when applied to the denuded skin, has both an astringent and sedative action, arresting morbid discharges and allaying irritation. It soothes effectually the intense irritation that is often present in papular eczema; it is equally beneficial in fissured eczema of the palmar and plantar surfaces. It is a useful remedy in hard and indurated papular acne of the face, neck, and back, and in rosacea.

*Mercuric Oleate.*—The ointment of mercuric oleate (mercuric oxide, 1 part; oleic acid, 3 parts; added to lard, 12 parts) is a yellowish chemical combination having a fatty smell, and an unctuous consistence. It has a stimulating, resolvent, and alterative action on the integument, especially upon tumors, glandular enlargements, indurations, and thickening of the skin. In some old cases of eczema, in which the skin has become greatly infiltrated, the twofold action of the ointment of mercuric oleate is often attended with happy effects. It is an acceptable and, at the same time, beneficial agent in obstinate ulcers and indolent papules, tubercles, and in infiltration attendant upon abscesses, in inflammation of the hair-follicles of the beard, and scrofuloderma. It can be used with success in excess and deficiency of pigment. It is a useful remedy in both the animal and vegetable parasitic affections. In all varieties of vegetable parasites, it is not only effective on the surface, but possesses the power of penetrating into the hairs, the follicles, and sebaceous glands, and thus killing the fungus that has passed into these parts.

*Mercurous Oleate.*—The ointment of mercurous oleate is very much stronger in mercury than that of mercuric oleate—in the ratio of 41.6 to 26.2, or about one and a half times as strong. It has marked stimulating action bordering on congestion of the integument, and has a decided resolvent and alterative effect. It is, therefore, applicable to the same class of affections, especially those attended by infiltrations, in which the ointment of mercuric oleate is used, particularly if it is desirable to make a more decided impression.

*Morphine Oleate.*—Morphine oleate has, like all the alkaloidal oleates, a feeble action, and only upon the part to which it is applied. It can be employed in all irritable conditions of the integument, but many other stronger sedatives are preferable.

*Nickel Oleate.*—Nickel oleate mixed with a fatty base, in the proportion of from one to sixty grains to the ounce, has a very decided astringent action, almost bordering upon that of a caustic on abraded surfaces. The ointment of nickel oleate of a weak strength, from five to twenty grains to the ounce of lard, acts at times very well in epithelial ulcerations. It is often useful in exuberant granulations and in old callous ulcers.

*Quinine Oleate.*—Quinine oleate, both from physiological experiments and from repeated clinical experience, has proved with me of little, if any, service.

*Silver Oleate.*—Silver oleate, applied in its natural form to the abraded skin or sores, combines with the albumin and fibrin of the parts, forming a coat and thus excluding the air. It likewise causes a powerful contraction of the blood-vessels, and condenses and superficially destroys the tissue. Silver oleate sprinkled over ulcers, bed-sores, and exuberant granulations, will set up a healthier action of the surface. When previously dissolved with an equal amount of oleic acid, and then mixed with lard in the proportion of from five to sixty grains to the ounce, it forms a dark-brown, soft, and pliable ointment. The ointment of this oleate is a safe and efficacious remedy applied over the inflamed surface of erysipelas, or around the margins, to prevent the disease from spreading.

*Strychnine Oleate.*—Strychnine oleate can be applied to the integument in comparatively large quantities and for some time without producing any systemic action. Its local impression is weak, and it is a remedy of but little value.

*Tin Oleate.*—Tin oleate, mixed with lard or a fatty base, in the proportion of from ten to sixty grains of the former to one ounce of the latter, forms a grayish-brown ointment, possessing an astringent action. It renders good service in papular and fissured eczema. The ointment of tin oleate is of great utility in diseases of the nails. It assists in such cases in overcoming the brittle, split, and soft conditions that result from injury to the parts, or that follow certain affections of the skin. This ointment, especially when combined with a little carmine, forms an elegant article of toilet for the nails and surrounding parts, giving them a beautiful lustre. Agnail, or the ragged and attenuated skin at the base of the nail, that is so frequently observed from neglecting these appendages, can be relieved or checked by it.

*Veratrine Oleate.*—Veratrine oleate has a valuable action as a counter-irritant when used upon the unbroken integument.

*Zinc Oleate.*—Zinc oleate occurs as a fine, pearl-colored powder, with a soft, soapy feel, very much like powdered French chalk. It has both an astringent and stimulating action. In hyperidrosis and osmidrosis, or excessive sweating, fetid or otherwise, it is one of the very best remedies for topical use. It is especially applicable to those who suffer from an increased flow of sweat around the axillæ, genitalia, and palmar and plantar surfaces. Dr. William Murrell, in the "London Medical Record," of November 15, 1883, also calls attention to its value in local sweating. He reports that when mixed with thymol (1 in 500), and used as a dusting-powder, it forms an excellent application in many varieties of local sweating.

In acute vesicular eczema, in which the parts become covered with small vesicles, swollen, hot, inflamed or raw, weeping, and attended with intense itching, the combined protecting, astringent, and stimulating action of the zinc oleate will usually cause all the inflammatory symptoms to abate, the discharge to dry up, and the swollen skin to resume its normal condition. The late Dr. McCall Anderson has referred to its utility in eczema, especially of the nares, in an article published in the "Journal of Cutaneous and Venereal Diseases." The great advantage and value of the zinc oleate among the same class of cutaneous affections have been referred to by Dr. James Sawyer, in a communication to the "British Medical Journal," of February 10, 1883, and also in another to the "Birmingham Medical Review," published a year later. Zinc oleate forms an excellent and useful toilet powder for ladies who are troubled with shining faces or seborrhœa oleosa, dusted over the parts either alone or mixed with an equal quantity of arrow-root, bismuth subnitrate, or magnesia carbonate. It may be scented with the oil of verbena, or geranium or of rose. It likewise acts in an efficacious manner on an inflamed surface that is hot and tumid; in cases of erythema about the groins and axillæ; and is also beneficial in herpes and herpes zoster. One part of the powdered zinc oleate melted and intimately mixed with four parts of a fatty vehicle, yields an ointment which can be used in the same class of affections as those just enumerated and in acne, rosacea, subacute and chronic forms of eczema.

**Pastes.**—These preparations are similar to ointments, but of firmer consistence, owing to the larger proportion of powder which they contain. Both mineral and vegetable substances are used in making pastes. Among minerals the oxide of zinc, carbonate of calcium or magnesium, and talc are most frequently employed, while those derived from the vegetable kingdom are starch and lycopodium. Pastes protect the surface from atmospheric contact, and have the advantage of absorbing the secretions of the diseased part. They should be gently rubbed with the finger upon the affected area, and spread upon the epiderm in a moderately thick layer. This class of remedies is particularly adapted to the treatment of certain forms of eczema. Unna[1] has compounded a number of pastes having as a basis bassorin, casein, castor-oil mixed with shellac, collodion, or lead, etc. With these mixtures may be incorporated various medicaments, such as oxide of zinc, sulphur, salicylic acid, resorcin, chrysarobin, etc.

**Plasters.**—The use of plasters is a desirable means of keeping medicinal substances in continuous contact with the skin. They are particularly adapted to chronic and localized forms of skin diseases. They fulfil the triple purpose of protection, compression, and medical application; are cleanly, and can be used upon regions where it is almost impossible to secure the continuous application of ointments. In fissured eczema of the lips, palms, and soles, common adhesive, opium, belladonna, lead, and salicylic-acid plasters are useful. Aconite, aconite and belladonna, Peruvian balsam, bryonia, and soap plasters are serviceable in frost-bites. Mercurial and copper plasters act happily in local spots of syphilis, scrofula, keloid, warts, burns, corns, and callosities. Witch-hazel, hemlock, and ammoniac and mercurial plasters are useful in chronic eczema and psoriasis. Ergot, iron, lead, arnica, asafetida, and phytolacca plasters are beneficial in ulcers and bed-sores. Opium and arnica, opium and belladonna, and soap plasters often prove valuable in boils and carbuncles. Opium and iodine plaster frequently assists in removing deep spots of infiltration, especially in syphilitic subjects. Arsenic plaster causes sloughing, and has been used for epithelioma.

**Gelatin.**—The use of white gelatin dissolved in twice its weight of water, by means of a water-bath, and spread upon diseased parts of the skin, has been recommended by Pick, of Prague. The solution is a useful vehicle for suspending chrysarobin, mercury, betanaphthol, and other remedies. It is valuable in limited chronic affections, especially in psoriasis and eczema—the medicated gelatin solution forming not only a protection for the skin, but at the same time having therapeutic action upon it. Unna states that thin layers of gelatin, or collodion, augment perspiration. He considers the application of gelatin useful in fever. Gelatin preparations are largely used by Unna. For a general basis, he employs zinc gelatin, which may be made harder or softer by varying the proportions of its ingredients. His usual formula calls for fifteen parts each of zinc oxide and gelatin, twenty-five parts of glycerin, and forty-five parts of water. Other substances may be added to the mixture, according to indications. For eczema with excessive itching, the incorporation of two per cent. of ichthyol or five per cent. of extract of cannabis Indica is recommended; for pruritus, the addition of cannabis Indica, chloral hydrate, phenol, camphor, salicylic acid, etc. He recommends particularly a preparation which he terms "gelanthum," a combination of equal parts of gelatine and tragacanth. Gelanthum dries rapidly with a smooth surface, allows a uniform suspension of medicaments, incorporates larger doses of drugs than the older preparations of the same class. An additional advantage is that incompatible substances remain in gelanthum without any mutual action.

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[1] Therapeutische Monatshefte, November, 1891.

**Gutta-Percha.**—Auspitz recommended one part of gutta-percha with ten of chloroform as a permanent application in the same class of affections as mentioned in the paragraph on gelatin. The solution so prepared is known as *traumaticin,* and various drugs may be mixed with it and applied to the skin.

### CONSTITUTIONAL AND LOCAL TREATMENT.

The following mechanical remedies, the consideration of which I have largely extracted from one of my papers[1] treating of them, can be employed either for their systemic or local action, or both, or as an assistant to topical medication. I shall speak of these remedies under the following headings, and for a more detailed description will refer readers to my paper read before the American Medical Association, and to my text-book on "Materia Medica and Therapeutics," Seventh Edition.

**Kinesitherapy, Massotherapeutics or Massage.**—As a general remedy, massage has been long and favorably known, but has been seldom employed as a method of treating diseases of the skin. In certain morbid states of the integument, it is, when properly used, attended with a most beneficial effect, and often results in restoring the surface to its natural condition. The functions of the skin are roused into full activity. The volume and rapidity of the cutaneous circulation are increased. The secretions of the skin are augmented and cutaneous respiration is promoted. From the sensory and tactile end-organs, a beneficial effect is produced upon the central nervous system. A simultaneous or successive conduction of influence from many parts of the surface, affecting many centres, directly contributes to the restoration of exhausted energy. The practice of massage increases muscular strength. Manipulation of the abdomen, properly performed, exalts the functions of the viscera contained within its cavity. It excites peristalsis, stimulates the menstrual function, and, in man, invigorates the testes. The appetite and digestion are improved. The urine is increased in quantity and variously altered. Massage not only acts directly on the part, but by its indirect effect, when employed over the general surface, will impart tone and vigor to the entire system. This direct as well as indirect action of massage renders it available both for its local and constitutional effect in many diseases of the skin. Massage is a most important and valuable adjuvant in promoting and increasing oxidation in psoriasis and scrofuloderma. In these and other similar pathological conditions, the skin is rendered more active by its use, the effete products are removed, and the red corpuscles of the blood are increased. It is especially advantageous for its effect in neuralgia, in perverted sensibility, and trophic disturbances of the skin. In these neuroses it relieves pain by its sedative and counter-irritant effects, and has a tonic action upon the nervous system. In gouty skin-eruptions it promotes local circulation and prevents local deposits of uric acid or other irritating substances in the skin. In some of the subacute forms of eczema, in which the integument is covered with groups of papules somewhat thickened and dry, the application of massage will often arouse the activity of the absorbents, increase the circulation, lessen or arrest the itching, and restore the skin to its natural condition. It is, however, in the chronic form of eczema, that massage has been, according to my experience, both effective and curative. In chronic cases of eczema, where the integument is deeply infiltrated, rough, thickened even to a leathery state, hard and dry, upon which medication has been used without any result, the application of massage breaks up the exudation, stimulates the absorbents, removes the inflammatory products from the parts, and restores them to their natural condition. It is equally efficacious in the same disease when the integument is covered with confluent patches of papules, and more or less infiltration with dryness of the surface, and attended with an intense and persistent itching. The abnormal and pent-up products are generally speedily removed, the massage having a sedative action on the parts as well as on the entire body, a pleasant state of repose following. Massage is a useful and beneficial application in the dry form of seborrhea and in thinning and loss of hair; the sluggish circulation being augmented, the absorbents made active, and tone and vigor being imparted to the glands and hair-follicles. It is likewise a valuable agent in indurated acne, in glandular swelling, and in excessive and deficient pigmentation of the skin; by properly conducted massage the choked-up absorbents are aroused to activity, and the parts are soon restored to their normal condition. Massage not only acts in this local manner, but it is an important remedy applied over the general surface in curing or assisting to remove many functional derangements, such as gastric and intestinal disorders, with or without constipation, which are insidious factors in many cutaneous diseases.

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[1] Extracted from a paper read by the author before the Section of Dermatology and Syphilis, at the meeting of the International Medical Congress at Copenhagen, Denmark, August 12, 1884.

**Compression.**—Compression, which is very useful in the treatment of diseases of the skin, can be applied by means of any substance that will afford rest and support to the affected parts. In many affections of the skin, it will either prove curative or assist medication in overcoming the morbid state of the tissue, which often resists for a long time the action of drugs. Compression is a valuable means to use in eczema, especially that form which involves the abdomen, the nates, and the genital regions. It serves in these affections to protect the parts, prevents friction with the adjoining portion of the integuments, and limits the spread of disease. It relieves the congestion in such cases, and arrests the effusion. It is also very effective in acute and subacute eczema by soothing muscular irritation, toning up the dilated capillaries, and preventing the escape of serum. Compression is an important adjuvant in the treatment of certain eruptive fevers, for edema after erysipelas, as well as in eczema, furuncular and glandular affections, herpes, herpes zoster, and urticaria. It can be employed with muslin, gum, or woven bandages—the latter being especially serviceable—or with simple or medicated plasters. A superficial compression is obtained by painting the surface of the skin with several coats of flexible collodion. This is useful in acne rosacea, in rhinophyma, and some forms of lichen and local hyperemias.

**Blood-letting.**—The abstraction of blood is beneficial in diseases of the skin; both by its general and local effect. It is a powerful antiphlogistic remedy, and acts in a speedy manner in relieving and in arresting morbid changes of the skin. Blood-letting is not only valuable as an adjuvant in treating certain obstinate cutaneous diseases, but it is also useful in chronic affections, after medication has been exhausted without having any effect upon the parts. Blood may be abstracted either (1) topically, as from the capillaries of the integument, or (2) generally, from a vein or artery. Local depletion is a common and useful form of abstracting blood for the treatment of diseases of the skin, general blood-letting only being used in a very few instances. Topical blood-letting may be performed by puncturing, scarification, or leeching.

**Puncturing.**—The integument can be depleted either by a bistoury, a tenotome, or a short pointed needle; the one which I use in my practice I have termed the "dermatome." Puncturing the skin relieves the congestion and stagnation of the blood in the vessels, by equalizing the circulation, stimulating the action of the absorbents, and thus removing all deposits from the tissue. It is decidedly effective in chronic eczema, acne, scrofuloderma, carbuncles, erysipelas, excess of pigment, and in the neuroses.

**Scarification.**—Multiple, linear, superficial incision of the skin, although not as frequently employed as puncturing, is, nevertheless, an important means to use over an inflamed surface, the relief brought to the parts from dividing the engorged blood-vessels being often most decided.

**Leeching.**—Leeching, while inferior to puncturing and scarification, for the abstraction of blood, can be resorted to in nervous persons, who fear the use of the knife or the needle.

**Venesection.**—Venesection will bring a decided relief in certain cutaneous eruptions, especially in strong, robust subjects bearing every evidence of a plethoric state of the system. I have employed it with success in general eczema and psoriasis. To obtain a lasting effect regulation of the diet is an important adjuvant. The administration of hydrogogue cathartics, by draining serum from the vessels, approximates the effect of bleeding. These expedients are in constant use in dermatology, especially in acute inflammations.

**Incisions.**—Incisions are made upon the integument for the purpose of exposing, dividing, or removing the parts. They are valuable in sebaceous cysts, lymphatic enlargements, in local inflammatory patches, to relieve the tension of the integument, to divide sensitive nerves, and to give a free exit to effusions and to pent-up inflammatory products. Incisions are employed with advantage in sycosis, rosacea, erysipelas, skin abscesses, boils, and carbuncles. Slight, multiple, parallel incisions constitute scarification. (See page 133.)

**Excision.**—Excision, or the removal of a part, can be accomplished either by the knife, by ligature, or by crushing. It is used for benign and malignant tumors of the skin. It is also useful for the removal of horns, moles, and especially warts.

**Enucleation.**—Enucleation is employed to rapidly peel out diseased structures, especially after the skin and capsules have been incised over morbid growths.

**Scooping.**—Scooping is a fragmentary enucleation. It is usually performed with a smooth, sharp spoon, and is an efficient method for removing broken-down products and pent-up secretions, especially in cutaneous abscesses, sinuses, and strumous glands.

**Scraping.**—Scraping is but a modification of scooping, and is superficial in character. It can be performed with the knife edge, rasp, or any rough substance. The curette is, however, the instrument most generally used. In this way morbid products can be removed, as in lupus, cancers, etc., thus facilitating the application, or assisting the action, of local remedies.

**Cauterization.**—Cauterization can be performed by the use of a metallic substance heated to a high degree of temperature, or through the action of the solar rays and a lens, or by the galvano-cautery, as well as by any of the various caustic medicinal agents. The mechanical cautery, as usually employed, consists of variously shaped pieces of iron, needles, pins, or any other metallic substance which is heated to either a white, or dull-red, heat, and applied to the affected integument. The success of the judicious application of the actual cautery to morbid growths of the skin, especially in lupus and cancerous affections, is already well known to every practitioner, and simply needs to be mentioned in referring to the great value of this useful mechanical agent.

The mechanical remedies that I have thus briefly enumerated can be used alone or combined. They will be found to be invaluable adjuvants, and are powerful agents in arresting and removing some of the most obstinate diseases of the skin either in conjunction with other treatment, or after medicines have entirely failed.

**Electricity.**[1]—In the treatment of diseases of the skin, electricity[2] has an extensive and interesting field of application; and all the usual forms in which this agent is used in general medicine[3] and surgery have been utilized, to a greater or less extent, in dermatology.[4] The faradic or induced currents are more frequently employed than the currents of high potential from the static apparatus, but the most useful of all forms is the galvanic or voltaic current, or the cell current, which is of comparatively low potential but of large volume.

The current from the storage battery, or the street current for lighting purposes generated by the Edison dynamo, may be substituted for the galvanic, or cell, current in connection with the current controller and milliampèremetre for all purposes to which the former is applicable, and is coming more and more into use by physicians in their offices. The static or large induction machine, which produces sparks of several inches in length, is employed not only as a stimulant for acne and chronic skin lesions, but also as a source of the x-rays, which have been found so effective in treating ring-worm, alopecia areata and epithelioma of the skin.

The moist structures of the human body are as a rule good conductors of electricity; but the dry skin, on the contrary, is a very poor conductor, and offers the principal obstacle to the medical employment of this force. Since the dry skin exhibits such decided resistance, it is customary to moisten the part to which electricity is to be applied, and this is accomplished best by having the electrodes in the form of sponges set on handles, or, what is better, moistened absorbent cotton may be used instead of the sponge. Saline solutions being much better conductors than pure water, it is advisable to employ salt water for this purpose when it is desired to have electricity penetrate the skin. Where the effect is especially intended for the epidermic structures, or where the cutaneous nerves and capillaries are principally to be impressed, dry metallic electrodes[5] may be used. These may be had of different sizes and shapes; one in the form of a sphere, half an inch or more in diameter, made of steel which may be nickel-plated, is useful in dermatology for applying electricity to the various diseases of the skin.

The roller electrode of Dr. Butler is employed for general electrization of a portion of the surface to improve the nutrition of the skin, or the wire brush may be used, which is very stimulating, being agreeable to some and rather painful to others. In electrolytic work, the needle-holder is convenient, not only for epilation, but also in the treatment of hypertrophied scars, and for obliterating the dilated vessels in rosacea. For galvano-cautery applications to nevi and malignant growths in the skin, the ordinary forms of instruments are employed.

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[1] See paper by author, on "Electricity in the Treatment of Disease," Medical Record, November 10, 1906.

[2] See paper by author, on "Electricity in Skin and Venereal Diseases," the Medical Bulletin, October, 1889.

[3] See paper by author, on "The Therapeutic Uses of Electricity," Journal of the American Medical Association, August 17, 1889. See author's chapter in his work on "Materia Medica and Therapeutics," seventh edition, part III, 1908.

[4] See author's paper on "Electricity as a Cosmetic," The Medical News, New York, October 13, 1894.

[5] "The Use of Metallic Discs and Cylinders in the Electrical Treatment of Diseases of the Skin," Medical News, July 27, 1894.

Electricity not only acts, when properly applied, as a nervous stimulant, and to some extent as a vital energizer of growing cells, but also as an alterative where cell-action is abnormal. That during life there are physiological electrical currents generated in all parts of the human body and especially the muscles, nerves and nucleated cells, is now generally conceded. These currents undoubtedly play an important part in carrying on the functions of cells and organs. Clinical experience shows that the passage of electricity through the body by including portions of organs in the circuit, when currents of a certain strength are used, has a decided effect upon the blood-supply and the nerve-force, as is clearly manifested by physiological and therapeutic effects upon the parts thus included between the electrodes. The discovery of electro-capillary phenomena and the effects of so-called currents of polarization, within recent years, has shown the identity of the electrical phenomena occurring normally in the human organism, and those induced by the passage of the galvanic current. According to the hypothesis of Becquerel, Dujardin-Beaumetz, and other well-known clinical authorities, the muscles and nerves have electrical currents of their own, and when these have been altered by disease, the clinical application of faradism and galvanism may restore lost function in nerve or muscle. This is probably true also of the skin, which in some disorders is deficient in its blood-supply and sensation, both of which are observed to be notably increased by electrical stimulation. Not only are motor and sensory nerves stimulated, but the trophic nerves and vaso-motor fibres have their functions materially increased, so that in atrophic affections and disorders of the sensation (paresthesia, etc.) electricity is frequently of advantage. As regards the forms of currents to use, it was succinctly stated by Dujardin-Beaumetz[1] that: "When we desire to modify the cutaneous sensibility and nutrition in general, we make use of static electricity; when we wish to limit electricity to a group of muscles, or when we wish to restore contractility to certain muscles, we use the faradic machine; when, finally, we wish to modify the molecular state of certain nerves, or to give a new activity to certain tissues, we employ galvanism." The latter form is also used in performing electrolysis for the destruction of hair-follicles or removal of new growths. Since in experiments in electrical decomposition of chemical compounds

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[1] Clinical Therapeutics, Dujardin-Beaumetz, translated by E. P. Hurd. George S. Davis, publisher, Detroit, Mich., 1885, p. 35.

(electrolysis) the acids always go to the positive pole, and alkalies and similar basic bodies go to the negative pole, the former is sometimes called the acid pole and the latter the alkaline pole.

Similar modifications tend to occur in living tissues under the influence of strong currents, and this is made more effective if the electrodes are wet with various saline solutions which are decomposed by the current. When this occurs, part of the medicament passes directly into the skin and may flow with the current entirely through the body, as demonstrated conclusively by Munk, Von Bruns, Adamkiewicz, Peterson, and others. This procedure is known as electrical cataphoresis, and it has recently been utilized for the introduction of chloroform, quinine, mercury, and other agents through the skin. On account of this separation of chemical compounds into their constituent principles this process is known as "ionization." Dr. F. Woodbury has used lithium iodide in solution in this way for the removal of syphilitic tubercular lesions from the skin with good results.[1] In connection with the polar effects just mentioned, it is interesting to note that Glatz confirms the clinical observation that, in bipolar applications, the positive pole is the more sedative and calmative in neuralgic affections.[2]. He applies the positive pole to the seat of pain with a small electrode, while the negative is placed at a convenient distance with a larger electrode. The current must be of medium intensity. In such cases chloroform or cocaine solution can be applied on either pole, to increase the sedative action, and make the relief more lasting.

Static electricity is very beneficial in many nervous affections of the skin; and the psychological effect of the sparks undoubtedly contributes to the curative action. Paresthesia, or pruritus, is frequently relieved by it, especially where it is a symptom of senile or other changes in the skin; and formication accompanying central nervous disease may also be held in abeyance by franklinic electric baths. The lividity of the skin in nervous disorders may be entirely relieved by this acceleration of the circulation under a series of short sparks. Neuralgia or dermatalgia of the scalp, soles of the feet, and other parts of the body, is sometimes benefited by franklinism after the failure of other forms of electrical treatment. Horns, corns, callosities, warts, hardened cicatrices, and other hypertrophic developments of the skin, are often removed by daily applications; while a similar result follows in cases of the tendency to repeated eruptions of blind boils, hard papules, acne marks, and sluggish lymphatic glands, by strong sparks.

In eczema and psoriasis, I have repeatedly observed good results from franklinism, especially where infiltration has occurred, and there is obstruction to the local circulation by inflammatory deposits, which are speedily caused to be absorbed by these applications. Roughness of the skin, as in scrofuloderma, is in a great measure remedied by thorough franklinization, while there is noted a general systemic tonic effect. In hyperidrosis, bromidrosis, in parasitic affections, such as ringworm, favus, and tinea versicolor, I have also observed undoubted benefits follow from static treatment; and two instances have been reported in which Guinea-worm has thus been cured. As a general tonic to the skin, or as a counter-irritant, franklinism is as reliable as galvanism or faradism.

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[1] "On the Employment of the Cataphoric Action of the Galvanic Current for the Removal of Syphilitic New Growths," Medical News, June 21, 1890.

[2] Revue Médicale de la Suisse Romande, May 20, 1889.

Faradic electricity is useful for about the same class of cases as static electricity, and stands between this and galvanism in its effects upon the skin. In hemophilia and hematidrosis, faradism causes contraction of the capillaries, and by a similar action it is curative in chilblains. In acne lesions, papular and chronic eczema, psoriasis, pemphigus, and paresthesia or pruritus, faradism often relieves the itching and reduces the infiltration that may be present. In scrofuloderma, chronic sycosis, chronic ulcers, and obstinate syphilitic patches, the writer has frequently observed good results to follow the judicious use of faradism alone, or alternating with franklinization or galvanization. It is hardly necessary to say that thorough cleanliness and antisepsis of the electrodes are necessary, and these may be secured by covering the electrodes with absorbent cotton, which is to be changed for each *séance*. The solution employed to moisten the electrodes, may contain antiseptic agents, such as boric acid or the official antiseptic solution may be used for this purpose.

In chronic eczema and psoriasis, especially when the patches are much thickened, and attended with marked itching, the author has accomplished by daily treatment with galvanism, the very best clinical results. The infiltration and itching usually lessen, and the skin is rendered more active and is amenable to other local treatment that formerly had failed to act. Mild currents are needed, and, if there is liver or stomach disorder, the positive pole is to be placed over the affected organ, and the negative to the lesions upon the skin. Erysipelas may be checked by galvanism, the anode being placed in the centre of the patch, and the cathode moved slowly around the circumference. Suppurative swelling of the skin or of the subcutaneous connective tissue, such as boils, incipient abscesses or carbuncles may be averted, aborted, or cured by prompt galvanization, if the disorganization has not proceeded too far. In psoriasis due to nervous depression the constant current acts both as a tonic and as a local therapeutic agent, and is frequently curative.

In herpes, simplex or zoster, mild but continued galvanization removes the intense burning and prostration, and the progress of the disease is retarded. Similar good effects are seen in rhus-poisoning or dermatitis venenata. Discoloration of the skin, lentigo (freckles), chloasma, vitiligo, acne, seborrhea oleosa, rosacea, and birth-marks, are generally amenable to galvanic treatment combined, if necessary, in the latter two affections with galvano-puncture.

Galvanization is required for thorough epilation (electrolysis), and is unequaled, except by the x-ray, as a stimulant in alopecia, if the hair-bulbs are still living. Antiparasitic applications are more efficient when applied by the electrodes, and a moderately strong current is employed to drive them into the skin. This process, as already stated above, is known by the term "ionization," as the remedy is decomposed by electrolysis and is carried in the form of ions through the tissue. It has also been called "electric cataphoresis." In chronic ulcers of the leg, remarkable results may be obtained by driving in weak solutions of corrosive chloride of mercury in this way. In tinea versicolor and skin cancer, benefit may be looked for in the same direction. In the treatment of condylomata and warty growths of the urethra and verrucous pigment nevi of the face, Ehrmann, of Vienna, uses a sharp-pointed steel needle for the cathode, which is inserted into the mass about to be removed, while the anode, a moist electrode, is placed indifferently or held in the hand. Where the warts are numerous, from three to six needles attached to one electrode are inserted at the same time. He objects to the use of lancet-shaped needles, preferring round ones, which are easier to introduce, and cause less destruction of tissue. The strength of current employed is from one to one and a half milliampères. M. Vogel, of Eisleben, in the treatment of vascular nevus, teleangiectasis, employs one electrode which contains both insulated poles, consisting of two or more fine steel needles separated from each other by one millimetre. The advantage of this is that it leaves the hand of the operator free. Scarring may be avoided by using weak currents, and not continuing the *séances* too long. Graefe follows Voltolini in having both poles terminate in needle-points, and not the cathode only. In fibromata of the skin he thus obtains cures after several sittings. This same authority also reports an interesting case of a physician, who during a post-mortem inoculated his index-finger with tubercular disease, which subsequently manifested itself by tubercular nodules. These entirely disappeared by electrolysis without any glandular infection taking place. No new nodules were apparent at the end of nine months.[1]

Electro-puncture, used by Magendie in the treatment of neuralgia, has been lately revived in the form of galvano-thermy, which is a most powerful revulsive method. By means of a storage battery, a wire electrode is heated to redness, and it is then introduced to the depth of half a millimetre at points some little distance apart over the tract of the affected nerve. They cause considerable inflammation, but afford marked relief in neuralgia. With the aid of an anesthetic, this might be used in malignant pustule, lupus, epithelioma, and carcinoma. Among the individual applications of electricity, it should be noted that in scleroderma, Schwimmer reported successful results in one case after eighteen months' treatment by galvanization. The galvano-cautery is useful for many minor surgical operations upon the skin in primary syphilis, chancroids, epithelioma, and lupus.

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[1] Annual of the Universal Medical Science, F. A. Davis, publisher, vol. v, p. c. 27.

In morphea, Liebig and Rohé[1] declare that localized applications of galvanism have long been regarded as the only treatment that promises success. In true keloid, as also in simple hypertrophied scars, success has followed multiple galvano-puncture and electrolysis. If the essential feature of all inflammation be the presence of certain forms of bacteria, and we have in the positive pole an agent which will remove the *causa morbi*, electricity is destined in the future to play a still more important rôle in skin diseases than hitherto.

The success which has followed the recent introduction of the x-rays in dermatology, in the treatment of epithelioma, lupus and other infections of the skin, have already won for this new therapeutic agent an important place among our resources for controlling diseases of the skin and their appendages.

**Röntgen Rays in Dermatology.**—Dr. Charles Lester Leonard, of Philadelphia, insists upon the importance of the possession of sufficient technical knowledge and large clinical experience on the part of the therapeutist, as a necessary prerequisite for successful results.

The lesions to be treated may be divided into superficial and deep, non-malignant and malignant. The indications for treatment, and the probable results will vary with these factors. In other words, malignant disease must come for treatment, by the Röntgen method, at an early period of its development, or of its recurrence, if other than palliative results are to be hoped for. In but few instances is primary treatment by this method advisable except in superficial lesions. The most valuable application of this method in the treatment of malignant disease is undoubtedly its post-operative employment in conjunction with radical operation; the more this combined method of treatment becomes generalized, the better will be results in the treatment of malignant diseases.

The Röntgen ray was first employed in chronic lesions which resisted ordinary methods of treatment, but its application is not limited to these conditions, as subacute and even acute lesions yield even more readily to its influence.

The rapidity with which superficial tubercular lesions, notably lupus vulgaris and lupus erythematosus, yield to this method of treatment suggests a similar marked influence upon tubercular processes in general. So far this has been realized, in the experience of Dr. Leonard, chiefly in the treatment of tuberculous adenitis and the sinuses resulting from their currettement and drainage. Here the stimulant effect on living tissue, with the accompanying destruction of cells of low vitality, is particularly marked. The decided bactericidal action may be due either to a specific effect of the Röntgen ray on the organisms in tissue, or to an antitoxin which it develops by its stimulant and alterative action on normal tissue. This beneficial action is produced through the medium of the rays themselves since equally favorable results are produced upon tuberculous glands that have not been operated upon, or have not reached a stage of degeneration and softening, and may also be witnessed in tissues at a distance.

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[1] "Practical Electricity in Medicine and Surgery," F. A. Davis, Philadelphia, 1890, p. 372.

The Röntgen treatment acts upon the hairs and hair-follicles, as is shown by the depilatory action of the rays. The removal of the hairs facilitates treatment by other means, but a more important action is produced upon the follicles themselves. Among some of these conditions, which Dr. Leonard reports as having yielded to treatment, are sycosis, favus, ringworm, alopecia areata and hypertrichosis. A severe case of sycosis of the upper lip yielded readily after the removal of the hair and subsequently remained cured with a new growth of all the hair.

In alopecia areata, the treatment must be purely stimulant in contradistinction to the depilatory action demanded where the hair-follicles are the seat of infection. The variation in effect is therefore entirely dependent upon the strength of the dose, *i. e.*, whether it is stimulant or severe enough to be destructive. In the lesions of this character, Leonard has never seen atrophy of the skin, telangiectasis or depigmentation occur. In one patient, treated successfully for sarcoma of the tonsil, the treatments were necessarily severe and the beard was completely destroyed, and although it has remained away for over two and a half years, there is no abnormal condition of the skin.

The advantages of the Röntgen methods over the Finsen light treatment for lupus, are that the whole area can be treated at once, and the subcutaneous variety can be cured without breaking down the skin. There is always less disfigurement than after currettement.

In a case of lupus erythematosis with extensive ulceration on the nose, the reparative process was remarkable on account of the filling up of the ulcerated areas before cicatrization took place, while there was little scar formation. In a case of deep-seated lupus of the chin, absorption and healing took place without the destruction of superficial tissues. This method, he declares, is undoubtedly the best we possess for the treatment of this condition, which is fortunately rare in this country.

Among the other chronic persistent skin lesions that have yielded to the stimulant and alterative action of this agent, are eczema and psoriasis, while the acute lesions of acne heal under gentle stimulation rapidly and with the avoidance of all scarring. Among the cases of eczema cured, some have been of very long standing.

In a case of resistant and long standing psoriasis, involving many areas on the body, a cure of many of the lesions persisted for over two years, although relapses have taken place in the more deeply infected patches.

While acne vulgaris depends upon the health and the general condition of the patient, it is a local condition, which will yield rapidly to the local stimulative and alterative action of the Röntgen rays. The rapidity with which changes take place, with freedom from scarring, even where deep-seated pustules are present, make this the most efficient method of treating this very common and yet persistent form of disease. There are many other skin lesions in which this method of treatment has been employed with great efficiency and remarkable results. Keloid, though requiring a long series of treatments eventually yields to the action of the Röntgen rays. It is considered that lesions of keloid are liable to break down and change through retrograde metamorphosis into malignant disease, as in a case recently under treatment and apparently cured, the necessity for early treatment will be realized.[1]

We may conclude with Dr. G. F. Pfahler that:—The x-rays are of undoubted value in the treatment of certain cases of both superficial and deep-seated carcinoma and tuberculosis, but the more a case has been tampered with, the less likely it is to yield to the influence of the x-rays. Tuberculosis, whether of the skin or of the glands, will yield at least in certain cases to the effects of the x-rays. Daily treatments carefully and properly given will produce the best results. We should try never to produce a dermatitis beyond a simple erythema, but there are idiosyncrasies in certain people which render them most susceptible to the x-rays, and in these people serious burns may occur in spite of the most careful treatment. It is desirable to produce a distinct reaction in the treatment of lupus. Epithelioma involving the mucous membrane is much less likely to yield to the effect of the x-rays than when it simply involves the skin. The x-rays will give better cosmetic results than any other form of treatment in simple epithelioma of the face. Epithelioma of the mucous membrane should be removed as early as possible by the knife, and this followed by x-ray treatment. Operable cases should be operated on and in each instance followed by a course of x-ray treatment, and x-ray treatment should be given at the first sign of a recurrence. Inoperable cases should be given a trial with the x-rays, since even hopeless cases sometimes yield to this form of treatment.

**Phototherapy, Finsen Light Treatment.**—The chemical rays of light are especially useful in medicine on account of their power (1) of destroying bacteria, (2) of exciting inflammation of the skin, and (3) of penetrating the skin. In the method pursued at the institute of Dr. Finsen, at Copenhagen, direct rays of sunlight or the light of electric arc lamps of 50 to 80 ampères is employed. The light is concentrated by means of a convex lens. In order to avoid burning the skin, the heat-rays are cut off by a screen, consisting of an ammoniacal solution of copper sulphate, confined in a cell on one side of the lens, made by deepening the frame of the lens and attaching a plain piece of glass. The lens is hung upon an upright stand, so that it may be raised or lowered, and turned on a vertical and horizontal axis. In the case of the electric light, a system of lenses inclosed in a tube, resembling a telescope, is used. An area of skin of about one and one-half centimetres (3/5 inch) in diameter is treated for one hour every day. Redness, swelling, and perhaps bullæ may appear, but necrosis has never been observed. The most striking results have been attained in cases of lupus vulgaris and erythematous lupus. Dr. Finsen applied the same treatment to carcinoma, in some cases of which very encouraging results have been obtained.[1]

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[1] New York Medical Journal, April 28, 1906.

In the treatment of the sick, a light, cheerful room is of great assistance to recovery. Especially should an invalid have a room into which the sunlight may enter. The eruptions of the **exanthemata** are made easier by light and heat, and the course of the disease favored. Where it is not desired to have an eruption, the part of the body may be covered with a piece of muslin or an ointment which is impervious to light. Thus, in **small-pox** pitting of the face may be prevented by having the patient wear a mask of linen, or by covering the surface with mercurial ointment. Dr. J. W. Kime, of Fort Dodge, Iowa, has devised a combination of mirrors, which are employed to concentrate the sun's rays, which, after passing through a screen of blue glass, are directed upon the patient's body, at the distance of about eight feet, so that the rays will be focused upon the part to be treated. He has used it in chronic joint diseases, in parasitic affections of the skin, and suggests its use in pulmonary tuberculosis.

**Phototherapy, Electric Light Baths.**—The sources of energy employed for applying light to the skin for therapeutic purposes, are the sun's rays, and the electric light, both the incandescent and arc-lights being used. The direct rays of the sun may be employed, (1) generally, by exposing the nude body to them; or they may be applied (2) only to certain portions upon which lesions may be situated. In the latter case the light may be concentrated, or focused upon a small area by the aid of a hand lens. When the direct rays of the sun fall upon the naked skin, there is a general stimulation of nutritive processes, and the pigment layer of the epithelium is increased, ultimately causing darkening of the integument, or "tanning" by the sun. Dermatitis may be set up, which may go on to effusion of serum with the production of blisters, if the exposure has been prolonged. These effects are observed in the tropics at all periods of the year, and in other latitudes principally during the extreme heat of summer. Exposure of the body during swimming and standing on the bank in the sunshine, has caused the disappearance of patches of psoriasis in the course of the summer. The vegetable parasitic affections and superficial epithelioma have also been cured in this way. By the aid of the convex lens, a spot of epithelioma may also be treated by condensed rays of light, or it may be destroyed by the heat of the focused rays. In the same way, small nevi, tattoo-marks, powder burns, and moles may be destroyed, and allowed to slough away under a moist gauze dressing.

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[1] Shoemaker's "Materia Medica and Therapeutics," seventh edition, 1908.

When the source of illumination is the electric arc, we have the method of phototherapy especially devised by Finsen. This has been found especially useful in treating lupus exedens, scrofuloderma, and epithelioma. The arc light is especially rich in ultra-violet rays, which have been found to be destructive to micro-organisms. H. Thiele and Kurt Wolf have determined that the length of the rays which are most bactericidal in their effects, is between 300 and 265 mm. Hertel's researches with rays of the wave length of about 280 mm. showed that they destroyed infusoria, and that bacilli are rapidly killed without there being the slightest change in the culture medium. The toxins, such as in diphtheria, and ferments (trypsin and amylase) become much less active. Blue or violet light reduces nerve activity and gives a feeling of well-being. The disturbed insane rapidly become calm under its action. The fixation of the eyes upon a blue incandescent lamp (15 candle) for two or three minutes, is said to cause insensibility of the nerves of the face and has been utilized for slight operations, and particularly for the extraction of teeth. It has also been successfully used in vulvar pruritis, and in neuralgia. Sunstroke is due not to light, nor to heat, but to the actinic effects of the sun's rays. In fact the employes in certain industrial works, where electrical soldering is practiced, are often affected in a similar manner. It has also been observed that these workmen enjoy an immunity from gout and rheumatism, as stated by Garnault.

The incandescent light bath is now largely used. In its ordinary form, it is simply an enclosed box in which the patient sits on a chair, while the two divisions of the lid are hinged at the side, and are excavated so as to fit around the patient's neck. Inside the box are a number of electric lamps, ordinarily 20 to 50, arranged in upright lines at the corners or sides of the bath. The electric light baths may be given to patients lying on a couch by having the lights attached to four upright standards, which may be covered by a heavy curtain extending to the floor. The patient's face may be covered by a towel or napkin. These enclosed lamps should be especially made for the purpose, tubular instead of pear-shaped, and contain a straight carbon filament, which is placed exactly in the focus of a parabolic inflector. These lamps are arranged so that the rays are concentrated upon the patient. If desired blue or red lamps may be substituted. In case many lamps are used, an electric fan may be added to remove the moist heated air by forcing it through a hole in one side of the apparatus. An arc light may also be introduced for special cases; but it requires the aid of some incandescent lights, in order to produce a proper temperature, as the arc light produces very little heat. When the special action of the ultra-violet and violet rays are desired, the arc light should not be enclosed in glass, but in quartz, which does not interfere with the passage of the ultra-violet rays. The Cooper-Hewitt lamp, which is in the form of a long tube of glass containing vapor of mercury, gives off a brilliant bluish-green light, which is extremely rich in ultra-violet rays, especially when the glass is replaced by quartz.

It has been observed that in order to produce free action of the skin, a shorter time and a lower temperature are required in the electric light bath than in the ordinary hot-air bath. The patients usually sweat freely at a temperature of 27° to 30° C.; but a temperature of 150° C. is tolerated without complaint. In local baths arranged for certain parts of the body, such as the extremities, a temperature even of 180° to 200° C. has been attained in the electric light apparatus; while, in the dry heat apparatus, temperatures of 100° to 110° C. are the limits of safety and that only for a short time. From the mercurial vapor lamps the amount of heat given off is comparatively small.

The therapeutic action of the electric light baths is seen particularly in psoriasis. This action is not to be attributed to the heat, but to the chemical ray. Margaret Cleaves has reported cases of psoriasis treated by the arc light and completely cured; the temperature of the bath was not above 90° F. In alopecia areata some cures may be obtained by concentrated light or the Finsen light, but the results, on the whole, are not so successful as with the Röntgen rays. In rheumatism, and skin eruptions in rheumatic patients, also in anemia, chlorosis, neurasthenia and lowered conditions of nutrition which are met with, attending many diseases of the skin, the electric light baths have been not only a valuable auxiliary to other treatment, but therapeutic agents of great value in themselves.

The x-ray technic described in its application to dermatology is well summarized in a paper read by Mihran K. Kassabian before the Section on Cutaneous Medicine and Surgery of the American Medical Association.[1] It is, of course, necessary that the operator shall be an adept, who has first mastered the use of the x-rays for diagnostic purposes, and who has also become entirely familiar with the manipulation of the apparatus. From the Röntgen therapist's standpoint dermic lesions are classified as follows:

1. When slight stimulation is required, as in acne.
2. Where epilation is necessary, as in hypertrichosis, favus and ringworm.
3. Where it is desired to produce absorption of pathologic products, as in eczema, psoriasis and in lupus.

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[1] Journal of the American Medical Association, August 31, 1907.

4. In malignant types of diseases, such as epithelioma.

For the treatment of Röntgen ray dermatitis it is advised to avoid exposure to the rays, bathe the parts for ten minutes every day in hot water, and apply lanolin cream or simply a compress of sterile gauze wet with hot water. All irritating ointments and solutions should be avoided.

At the recent meeting of the Budapest Dermatological Society[1] considerable attention was devoted to the present status of radiotherapy. Broadly speaking, the view of the meeting was that there is no longer any question as to the specific fields of action of the Röntgen ray in all forms of acne, lupus, eczema, psoriasis, pruritus, tinea, sycosis, mycosis fungoides, senile keratosis, venereal condylomata, and hyperidrosis. Among the skin diseases that may be classed as erratic are pigmented vascular nevi, hypertrichosis, and acne rosacea. Of the first mentioned, about 18 per cent. are cured and about 28 per cent. are improved. It was stated that 80 cases of epithelioma, involving the skin only, were treated with no recurrence. When the tumour is situated at a muco-cutaneous junction it is well to have the glands removed after a period of quiescence has been brought about by the x-rays. Justus followed this method in several cases with no recurrence after two years. He considered the Röntgen rays sufficient treatment in the great majority of cases. The knife should be used only in cases where the tumor is situated favorably for radical removal. In cases having the characteristic odor he invariably anesthetises the surface and by means of the galvanic current drives into the tissue for a prolonged period of time zinc and mercury ions, following this medication with the Röntgen rays after the separation of the slough. Eighteen cases of carcinoma treated vigorously with the Röntgen rays were cured. In 14 cases the tumors and enlarged glands disappeared completely; in four they ceased to grow. He considered that all primary cases should be treated with the rays, excluding the knife. He does not believe in the existence of a case of sarcoma that cannot be markedly benefited by a prolonged mild radiation from an old hard tube, well coated with aluminium, the thickness depending on the individual circumstances existing in each case.

**High Frequency Currents.**—The modern static machine having at least twelve revolving plates, with a resonator, will yield the D'Arsonval, Tesla and Oudin currents, which have been employed to some extent in dermotherapy. The D'Arsonval current can be utilized in three ways: First, the direct, bipolar method is effected by using a metal plate, as the indifferent electrode attached to one end of the solenoid, and a glass vacuum electrode, or metal electrode, connected to the other end of the solenoid. The latter electrode is the one which is to be placed upon the point of diseased condition, and attached to the side of the positive Leyden jar. Second, this current may be used in the indirect or grounded method. The end of the solenoid on the side of the negative Leyden jar is to be grounded, as well as the indifferent metal plate electrode, and the glass vacuum electrode, or other electrode (connected with the other end of the solenoid), is placed over the site of the disease. Third, the method of autocondensation is practiced by covering the seat of an ordinary folding chair, with a piece of tin foil (22 inch gauze) large enough to extend the full length of the chair. Over the tin is placed two or more layers of very thick, soft felt. Place the patient on the chair thus prepared, and connect one end of the solenoid with the metal underneath the felt, and place another metal plate (7x10 inches) on the patient's body and connecting it with the other end of the solenoid.[1] The third method has been used by de Kraft in two cases of herpes zoster, and was found to give great relief from pain, to hasten healing and improve the general health. It has also been found to be useful in tuberculosis and faulty metabolism.

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[1] The Lancet, July 20, 1907.

The chief use of the Tesla current in therapeutics is as a means of step up from the D'Arsonval to the larger solenoid. The Oudin current with the large solenoid is possessed of remarkable penetrating powers. Both the monopolar and bipolar applications are employed. The first requires the patient to stand upon an insulated platform, or on the ground, while the operator holds the spray electrode far enough away to prevent the passage of sparks. The bipolar method requires the autocondensation chair above described, grounding the metal plate as well as one end of the Tesla, and holding the spray electrode at a sufficient distance from the part to be treated. The difference between this and the third D'Arsonval method is simply a difference of intensity. The same procedure can be adopted when using the spark. The spray and spark are chiefly useful in eczema, psoriasis, sycosis, warts, varicose ulcers, small epitheliomata, etc. The therapeutic power is attributable to the actinic properties of the spark and spray discharge, and its power to produce chemical change in the tissues, since it increases the solid constituents of the urine, accelerates $CO_2$ excretion, and increases activity of sweat glands. They may also check toxin formation and increase the vital resistance of the body.

**Radium.**—The new element discovered by the Curies in France, has been used as a substitute for the x-rays in the treatment of certain diseases of the skin. In 1904, Hartigan, of London, exhibited a number of cases before the Dermatological Society illustrating its value as a therapeutic agent. He especially advocated this treatment for the removal of *nævus flammeus* or port-wine stain of the skin. This work has been carried on especially at the Blackfriars' Skin Hospital, London, and also in *Laboratoire Biologique de Radium* in Paris. Among the diseases successfully treated by radium are epithelioma of the skin, *nevus maternus*, and strawberry marks, or *nevus flammeus*. For the latter, occurring in young children, radium has the advantage over the x-ray of being entirely free from pain. Lupus vulgaris and lupus erythematosus are also amenable to this method.

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[1] "Methods of Procedure in the Use of High Frequency Currents," by Frederick de Kraft, Journal of Advanced Therapeutics, November, 1906.

## PROGNOSIS.

The prognosis of cutaneous diseases depends upon the nature and intensity of the causative morbid processes, the individual equation of the patient, and often very much upon his ability and willingness to adopt the necessary measures for his recovery. It is influenced by the extent of surface involved, and the length of time that may have elapsed between the appearance of the lesions and the institution of a plan of treatment. Age, sex, occupation, habits of life, and the presence or absence of the various diatheses are also factors which must be taken into consideration. As a general rule, however, the prognosis is favorable. A large number of skin-diseases are either acute or subacute in character, and under favorable conditions, tend to a spontaneous cure; many others run a more or less chronic course, but eventually yield to judicious and persevering treatment. Some, on the other hand, are exceedingly obstinate, and are not amenable to any known method of treatment; fatal results rarely occur except in leprosy, rhinoscleroma, cancer and the acute contagious diseases.

Disorders of the sebaceous glands are usually only temporary in character, and may be readily cured or alleviated by appropriate remedies. Changes in character of the sudoriparous secretion are more persistent and less amenable to treatment. Hyperæmia of the skin is symptomatic of congestion of the vessels of the papillary layer, and is usually of brief duration, if the local cause can be abated.

The acute contagious inflammatory diseases vary in severity. Some invariably pursue a benign course, or are only occasionally fatal, while others are noted for their virulence or malignancy. The non-contagious inflammatory diseases also vary in course and duration. Many of them terminate, a few days after, in complete recovery. Occasionally death may ensue from the violence of the inflammatory action, or the accompanying constitutional debility, as in some cases of pemphigus and anthrax. Other diseases of this group, as prurigo and pityriasis rubra, are essentially chronic in character, and may remain for years without any apparent change.

Cutaneous hemorrhages are generally small in amount, and of trivial importance, except when symptomatic of certain grave changes in the blood, as in purpura hemorrhagica, and in the petechia of typhus, hemorrhages of small-pox, and the ecchymosis of black measles. Hypertrophies are usually benign in character and slow in development; they are difficult to remove, and manifest a tendency to recur. Atrophies of the skin or its appendages, are generally permanent.

The prognosis of neoplastic diseases varies with the benignity or malignity of the process concerned in the deposition of new material in the skin. Some, as fibrous molluscum and the different forms of nevi, are harmless in character; others, as lupus and scrofuloderma, tend to ulceration and destruction of the adjacent tissues; while leprosy, carcinoma, and sarcoma generally terminate fatally.

The neuroses are extremely variable in duration and severity. Sometimes they disappear as if by magic, after the employment of one or two simple remedies, while at other times they resist all treatment.

The parasitic affections are all curable, the first step towards scientific treatment and recovery being an accurate diagnosis.

# PART II.

# CLASSIFICATION OF SKIN DISEASES.

THE purpose of dermatologic classification is to arrange the different varieties of skin-diseases in more or less closely related groups so that they can be readily referred to, and studied in a simple and practical manner. Numerous systems have been proposed, which are so complex as to be of little or no utility. Hebra's classification, modified, made both upon an anatomical and pathological basis, in order to prevent confusion, is the system now in vogue, and the one most commonly accepted. It has, therefore, been followed in this work.

CLASS I. *Disorders of Secretion and Excretion* (*Anomaliæ Secretionis et Excretionis*).—Seborrhea, comedo, milium, cystis sebacea, anidrosis, hyperidrosis, bromidrosis, chromidrosis, sudamina, hydrocystoma, hydradenitis destruens suppurativa.

CLASS II. *Hyperemias* (*Hyperemiæ*).—Erythema simplex, erythema intertrigo, erythema scarlatinoides.

CLASS III. *Hemorrhages* (*Hemorrhagiæ*).—Purpura, hemophilia, hematidrosis.

CLASS IV. *Specific Inflammations* (*Exudationes*).—Cutaneous lesions of rubeola, rötheln, scarlatina, malaria, rheumatism, gout, variola, varicella, vaccinia, typhoid fever, typhus fever, cerebro-spinal fever, diphtheria (antitoxin), erysipelas, chancroid and syphilis. Also dermatitis, erythema multiforme, erythema nodosum, urticaria, lichen planus, lichen scrofulosum, prurigo, herpes, miliaria, pemphigus, hydroa, pompholyx, eczema, acne, rosacea, sycosis, impetigo, impetigo contagiosum, ecthyma, pityriasis rubra, furunculus, carbunculus, anthrax, equina, abscessus, ulcus, gangrena, combustio, congelatio.

CLASS V. *Hypertrophies* (*Hypertrophiæ*).—Lentigo, chloasma, nevus pigmentosus, callositas, clavus, cornu cutaneum, keratosis pilaris, psoriasis, lichen rubra, verruca, ichthyosis, scleroderma, sclerosis, morphea, elephantiasis, dermatolysis, hirsuties, onychogryphosis.

CLASS VI. *Atrophies* (*Atrophiæ*).—Albinismus, vitiligo, canities, atrophia cutis, atrophia senilis, striæ et maculæ atrophic, alopecia, alopecia circumscripta, atrophia pilorum propria, onychatrophia.

CLASS VII. *Tumors* (*Neoplasmata*).—Rhinoscleroma, lupus erythematosus, lupus vulgaris, scrofuloderma, molluscum epitheliale, lepra, epithelioma, sarcoma cutis, carcinoma cutis, keloid, molluscum fibrosum, xanthoma, lipoma, angioma, lymphangioma, neuroma, myoma.

CLASS VIII. *Neuroses* (*Neuroses*).—Hyperesthesia, anesthesia, paresthesia, dermatalgia.

CLASS IX. *Parasites* (*Parasitæ*).—*Animal:* Scabies, pediculosis, cimex lectularius. *Vegetable:* Tinea versicolor, tinea favosa, tinea trichophytina, tinea imbricata; erythrasma; trichomycosis nodosa, actinomycosis; mycetoma, blastomycetic dermatitis.

CLASS X. Lesions of Mucous Membranes, Leucoplakia.

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## CLASS I.

## DISORDERS OF SECRETION AND EXCRETION.

*(Anomaliæ Secretionis et Excretionis.)*

### SEBORRHEA.

SYNONYMS.—Steatorrhea—Pityriasis—Acne sebacea—Acne rubra seborrheicum—Seborrhagia—Cutis unctuosa—Tinea furfuracea—Ichthyosis sebacea—Schmeerfluss—Dandruff.

SEBORRHEA is a functional disease of the sebaceous glands, characterized by an excessive formation and altered condition of the sebaceous secretion, forming an oily coating, crusts, or scales on the skin.

**Symptoms.**—Seborrhea may occur upon any part of the body, but is usually limited to certain localities. The favorite seats are the scalp, face, back, chest, umbilicus, and the genital regions. It may in rare cases as a disease involve the entire body, as in the instance recorded by Biett. The vernix caseosa of new-born children, as well as that which affects certain races, particularly the negro, are illustrations of general seborrhea, occurring, however, as a physiological and not as a diseased process. In fact, the line of demarcation between the physiological and pathological conditions of the discharge of sebum cannot be drawn with precision in many cases. As a disease, its course will be found to vary according to the region affected and the state of the patient's health. It is usually more marked on the scalp, and less so on other portions of the body. It is especially liable to occur in those who are out of health, particularly in the anemic and chlorotic, and tends to lessen, or entirely disappear, as the system returns to its normal condition. It may be so trifling as to require little or no treatment, often vanishing with the removal of the cause; again, it may be extremely severe, often lasting months or years, and even with the most careful attention being subject to frequent relapses. In some instances, it may obstinately persist throughout life, notwithstanding careful treatment. The seasons may have an influence, it often disappearing in summer and returning in winter. The condition of the integument affected will also vary according to the extent of the disease, and the state of the poured-out secretion. It is mostly of a pale tint, and either dry or greasy. At intervals it may be more or less inflamed. Subjective sensations of either itching or burning, or both, may be present. The disease is encountered in two forms, according to the physical and chemical characters of the discharge, whether oily, or firm and dry, which are known respectively as seborrhea oleosa and seborrhea sicca. They occur occasionally together, either upon the same or different regions of the body, but usually receive the subjoined separate consideration. Under the general title of "Eczema Seborrheicum," Unna grouped all the manifestations here considered separately as forms of seborrhea, together with some anomalous forms of eczema which had been formerly described under this title.

**(I) Seborrhea Sicca.**—This is the most common variety of the disease. It is characterized by the formation of dry, yet somewhat greasy, dirty-white or yellowish scales or crusts. As it occurs both upon the hairy and non-hairy parts, and differs in character somewhat when appearing on different portions of the body, it will be described under the following local forms:

SEBORRHEA CAPITIS is a local variety of seborrhea affecting the hairy scalp mostly, but may extend to the face, the ears, or the neck. It may appear in infants as a continuation of the vernix caseosa, and persist for some time. It is met with on the vertex, the anterior fontanels, and occasionally over all the scalp, in the form of thin or thick, dry, friable, or fatty scales, crusts, or scabs, which are firmly adherent to the surface. The color will vary from a light yellow to a brown or black, the tint depending upon the dirt coming in contact with the parts, and the care which the children receive. The skin beneath may be normal, slightly macerated, or sometimes complicated with eczema; the hardened, adherent material exciting inflammation of the skin. After a time the disease generally spontaneously subsides, the scales and crusts disappearing with the growth of the hair. In adults, the disease manifests itself by the formation of thin or thick, gray or yellowish, dry or greasy scales. They are either loosely situated, or more or less adherent to the scalp; in the latter event the thick, fatty masses may bind the hair in close contact with the surface. As a rule, the disease invades the scalp uniformly; occasionally, however, it appears as one or several patches. The scaling will vary—scarcely visible in some, and so great in others as to hang loosely upon the hair-brush and drop off on the clothing, causing considerable annoyance. This abnormal condition of the hair-follicles and the coating upon the scalp may interfere with the growth of the hair, which may become dry and dull in appearance, the lustre disappearing, and slowly, or rapidly, thinning, which may, perhaps, lead to permanent depilation. In other cases, the morbid action may continue, and often become severe, without any structural alteration of the follicles or loss of hair. On the removal of the scales in this affection, the skin beneath may be normal or of a pale, dull-white tint, or somewhat hyperemic. Itching or a burning sensation is liable to occur, and is aggravated by errors of diet and loss of sleep. Perspiration of the scalp is common. The disease is chronic in its course, often continuing for years or a lifetime, especially upon its favorite seat, the crown of the head, frequently producing premature baldness. Seborrhea occurring upon other hairy parts of the body, as the eyebrows, mustache, beard, and pubic region, follows a similar course to that of the scalp.

SEBORRHEA FACIEI.—This phase appears chiefly about puberty, or between that period and thirty. It is more frequently observed in females than in males, and is met with particularly upon the forehead, cheeks, and nose. It is apt to occur as the oily variety, and will again be referred to under seborrhea oleosa. In the dry form it appears as thin or thick, yellowish, greenish, brownish, or blackish scales or crusts, well adherent to the skin, forming sometimes a mask, and occasioning much deformity. Extraneous substances frequently become entangled in the scales. If raised from the surface, they will be seen to reach into the follicles. On their removal the skin beneath will be found to be normal or reddened, but the scales quickly reform. Itching and burning sensations may be present. Acne, comedones, and eczema often appear at the same time. The disease, also, is a sequence of variola and syphilis. This form of the disease, in the aged, may terminate in epithelioma.

SEBORRHEA CORPORIS.—Seborrhea of the body calls for special consideration, as it has an appearance very different from that observed on other parts. It generally appears on the back, between the scapulæ, in the clavicular and sternal regions, and about the umbilicus, in patches of varying size and shape. One or more of these regions may be attacked at the same time. These patches are large or small, round or irregular and either sharply or ill defined. They may appear isolated, and remain so, or, what is more common, tend to coalesce, developing larger ones, invading the upper part of the back about the shoulders. In color they are pale-reddish, and partially or generally covered with yellowish or greenish scales. The scaling is usually scanty, and can be entirely removed, particularly by the friction of the clothing. The scales are also loose, or partially detached. The follicles of the parts are, in addition, patulous, and there may be acne papules and pustules about the margin of the patches. They will very often, particularly if the patches assume a circular arrangement with a clear centre, look very much like ringworm. Those on the chest usually incline to be circular in form, and to be covered with slightly shrivelled, yellowish or grayish, greasy or dry scales. There is generally only a single one, but several may exist, which sometimes continue or coalesce into one. The disease in this situation very often has the appearance also of ringworm, and not infrequently of a syphilitic patch. In seborrhea of the umbilicus, the collected sebaceous material rapidly decomposes, developing an offensive odor, and an irritation, with often an inflammation of the parts. Itching, and occasionally a burning sensation, are generally present in seborrhea of the body. The course of the disease is essentially chronic, and it is liable to frequent relapses.

SEBORRHEA GENITALIUM.—The genital organs in both sexes are abundantly supplied with sebaceous glands, and, owing to a too free use of water and soap, or, on the other hand, to a neglect of cleanliness, or from abuse of the parts, not infrequently become affected with seborrhea. The affection may be so slight as not to be considered a diseased state, or so severe as to give rise to marked inflammation of the skin. In males it involves the glans penis and sulcus. A white, greasy matter, the secretion of Tyson's glands, caused by the heat and moisture constantly present, rapidly decomposes, producing a fetid odor, and more or less inflammation. A discharge from the inflamed parts very often follows, which closely resembles and may be mistaken for gonorrhea or venereal sore. In females, the sebaceous material collects between the labia and nymphæ, and about the clitoris, occasioning at times an inflammation with a similar discharge to that just described. Seborrhea of this region is liable to occur both in women and young girls.

**(II) Seborrhea Oleosa.**—This form, which is not as frequently encountered as the other, appears as a fatty coating both on the hairy and non-hairy portions of the skin. It is, however, more common on the latter parts. The skin has a greasy appearance and gives an oleaginous impression to the touch, especially on bald heads. It may assume a dirty, unctuous appearance, owing to the dust which readily adheres to the surface. The secretion may be discharged in a sufficient quantity to collect in minute drops, which have a yellow color; or the oily fluid can be easily detected when a piece of very thin paper, or muslin, is applied to the skin. There are present sometimes crusts from the concretion of the poured-out secretion. The integument may have, in addition, a pale or reddened appearance, with patulous or plugged-up follicles, and give a cold sensation to the touch. The usual seat of the disease is the face, especially the nose, forehead, and cheeks, but it may appear upon other portions of the body. Its course of development may be slow or rapid. It may be so slight as neither to cause any annoyance, nor attract any marked attention. On the other hand, it may be so severe as to produce an itching or burning sensation, and by its disfigurement give rise to much annoyance, and in some instances to very great distress.

Dr. Arthur Van Harlingen reported to the College of Physicians of Philadelphia, in 1903, a very unusual case of seborrhea (oleosa), nigricans or black mask of the face, in a young woman 23 years of age. This condition differs from chromidrosis in the fact that the sebaceous glands are involved. The oily seborrhea attracts the dirt from the atmosphere, which becomes attached to the skin forming a dark colored layer. The patient referred to above was an invalid and had been confined to bed for several years. The crust resembled the rind of ham, it was friable and could be readily broken off. It formed a mask over the upper part of the face of almost inky blackness. The patient was highly hysterical. The incrustation was removed by the application of green soap and water. The skin underneath was sodden and a little abraded.

**Diagnosis.**—Seborrhea may resemble and be mistaken for eczema, psoriasis, lupus erythematosus, epithelioma, syphilis, ringworm, and ichthyosis. On the scalp it is liable to be confounded with eczema. The latter affection, if present, ordinarily has a history of discharge; the itching is constant and severe. Seborrhea, on the other hand, is a dry disease, and the itching is often intermittent and is rarely intense. Eczema inclines to occur in patches, and is apt to spread to the adjoining portions of the integument. Seborrhea, on the contrary, as a rule, appears uniformly over the scalp and is likely to be confined only to it. In eczema the scales are commonly scanty, dry—being made up chiefly of inflammatory products; in seborrhea they are more numerous, greasy, and are composed of sebaceous material. In eczema the skin is also red and inflamed, while in seborrhea it is pale. Seborrhea of the face occasionally resembles erythematous eczema, but the history of the disease, together with the presence of the greasy crusts, and often patulous follicles beneath, are sufficient for diagnosis.

Seborrhea and eczema, while differing in many respects as pointed out above, may coexist upon the same subject. The one affection may bring into existence the other, as in eczema of infants, which is liable to excite seborrhea. In a similar way seborrhea of the face, of the sternal and genital regions, may develop, at the same time, eczema of these parts.

Seborrhea is even more likely to resemble psoriasis, either of the scalp or body. If seborrhea exists, it generally covers the entire scalp; if psoriasis, the disease appears in patches circumscribed with intervening healthy skin, and similar lesions are present on other parts of the body, particularly on the extensor surfaces.

The scales in seborrhea are small, thin, and of a gray or yellow color, while in psoriasis they are larger, thicker, and white in tint. The skin of the scalp in seborrhea is pale or deadened in color, and seldom exhibits any inflammatory symptoms; in psoriasis, upon the removal of the scales, it is at all times red and infiltrated. Seborrhea may also have the appearance of, and be mistaken for, lupus erythematosus. The latter, it is known, begins sometimes as a congestive seborrhea, but, once formed, its symptoms are characteristic. Again, seborrhea, virtually, is neither sharply limited nor inflamed, as is always the case in lupus. In seborrhea the skin may be reddened and covered with many easily detached, greasy scales; in lupus it is more of a dark, reddened tint, and the scales, which are fewer, are also tenacious and dry. The disease is also distinguished from lupus by not being followed by the characteristic cicatricial tissue of the latter disease. Seborrhea and epithelioma, in their early stage on the face of old people, may present such marked similarity as to be easily confounded. The attendant atrophy, and the slight degeneration around and beneath the patch, are usually distinctive symptoms of epithelioma; but, if the peculiar small nodular lesions of the latter occur, the diagnosis can be readily established. Seborrhea may resemble, both on the scalp and the body, especially on the face and chest, some forms of syphilis. The history of the case, the involvement of the glands, the dark-red or ham color of the skin beneath and around the crusts, and the detection of other lesions in the form of mucous patches or old scars, would point to conclusive evidence of syphilis. It should be remembered, in this connection, that both diseases may likewise coexist—syphilis frequently exciting seborrhea. Seborrhea of the body, especially of the chest, may resemble very closely the lesions of tinea trichophytina. In ringworm, however, there is the history of contagion, its rapid course, the circular arrangement of the patches, the tendency to heal in the centre with the inflammatory periphery, and the evidence of a vegetable parasite, by microscopical examination; which should serve to prevent any error. Seborrhea can hardly be confounded with ichthyosis, the latter being a congenital, general, permanent disease, while the former is an acquired, local, and curable affection. In seborrhea the skin, upon the removal of the scales, presents a soft and natural condition, but in ichthyosis it is dry, harsh, and rough.

**Pathology.**—Seborrhea, which is a functional affection, consists in an increased and physically changed secretion of the sebaceous glands. There may also be an escape from the glands and their follicles of a certain quantity of epithelial scales. The secretion thus poured out may remain oily or solidify, and occasion the oily or dry form of the disease. If the disorder be permitted to become chronic, it may eventually terminate in atrophy of the glands and their ducts, giving rise to loss of hair, which may be permanent. If the discharged secretion is placed beneath the microscope, it will be seen to be made up of an amorphous, fatty, somewhat granular material, with more or less epithelial cells, foreign matter, and numerous micro-organisms.

**Etiology.**—A normal quantity of the sebaceous material in the skin assists in keeping it in a healthy condition. If the secretion, at other than the physiological period in the new-born, becomes excessive or unnatural, a diseased state has supervened. The numerous causes which produce this change, are mostly due to some general disturbance of the system. It may occur as the result of tuberculosis, cancer, the exanthematous and other fevers, an anemic or chlorotic state, or of any cutaneous disease which may impair the general health; or it may depend upon alimentary, uterine, or ovarian disorders. Again, it may be brought about by any local means which will give rise to an irritation or congestion of the skin, in persons who are otherwise healthy. Exposure to cold and heat sometimes occasions the disease, particularly on the face. Uncleanliness of the scalp, the use of hair-powders, dyes, pomades, irritating lotions and oils, or too severe combing and brushing, or the too frequent use of water or soap, or both, are no doubt active factors in causing the affection. Highly scented toilet-soaps, and those which are too alkaline, may induce this condition on a sensitive skin. Occasionally it occurs in the healthy without any apparent cause, but with care may often be traced to one of those I have stated. It appears at all periods of life, but is more common at the age of puberty, and in the female than in the male. The development of one or the other variety is not dependent upon any special cause, but upon the temperament of the person in whom it occurs. For this reason, individuals with light hair and complexion are more subject to the dry variety, while those with dark hair and complexion to the oily.

**Treatment.**—Seborrhea generally requires both constitutional and local treatment. The laws of hygiene should be rigidly enforced. Fresh air and especially sunlight, exercise, and nutritious food are requisites. The administration of internal remedies is to be directed against the cause upon which the disease depends. The bitter tonics, the preparations of malt, arsenic, iron, codliver oil, phosphoric acid, and the phosphates are indicated in the debilitated, anemic, and scrofulous. In derangement of the alimentary canal, the preparations of pepsin and nux vomica, with an occasional laxative or cathartic, will be found of service. In cases depending upon dyspepsia, especially the atonic form, the following combination will be valuable:

| | | |
|---|---|---|
| ℞ Pepsini sacch. | gr. x. | 0.60 |
| Strychninæ sulph. | gr. 1/80. | 0.0008 |
| Ol. menth. pip. | ♏ 1/30. | 0.002 |

M. Ft. chart No. j.
Sig.: Take after meals.

If constipation is present, one-tenth of a grain (0.006 gm.) of aloin may be advantageously added to each powder, or phenolphthalein may be given, as in the following pill, chocolate or gelatin coated, consisting of:

| | |
|---|---|
| ℞ Aloini | gr. 1/4. |
| Strychninæ sulphatis | gr. 1/80. |
| Ext. belladonnæ foliorum | gr. 1/12. |
| Pulv. ipecac | gr. 1/15. |
| Phenolphthalein | gr. 1/2. |

Dose, one or two pills at night, or one pill three times a day.

Seborrhea, at the age of puberty in those otherwise healthy, is often alleviated by the iodide of iron, two grains (0.12 gm.) three or four times daily, or the syrup of the iodide in usual doses. Another useful remedy is the syrup of hydriodic acid, one-half a teaspoonful, three times daily. It is sometimes of advantage to add from one to five drops of liquor potassii arsenitis to each dose of the latter medicine. Sulphur and its compounds, especially the sulphide of calcium, in small doses, have also been recommended. Where a tonic is needed, the syrup of the hypophosphites is useful, and this may be combined with strychnine, as in the compound syrup of hypophosphites of the National Formulary.

In well-marked seborrhea oleosa, Brocq thinks that he has derived some benefit from a combination of ergotin, belladonna, and hamamelis. Other drugs may be associated with these if indicated by the constitutional condition.

The local treatment is of the utmost importance. It will, however, vary according to the region involved, the duration of the disease, the extent of crusting or scaling, and the degree of irritability of the skin.

As seborrhea of the scalp is the most common form, its treatment will be referred to more in detail. It is not necessary to cut the hair, as it will in no way assist, or facilitate the treatment. The remedies can be applied effectively whether the hair be long or short. A simple or medicated oil is, perhaps, the most advisable to employ, particularly if the hair be long. It softens and loosens the accumulated masses of sebum and scales, and removes them from the surface. The oil of ergot is the best agent to use for this purpose, as it possesses not only the power of removing the sebaceous material, but, by its astringent and slightly stimulating action, proves of benefit to the diseased follicles and glands. In ordinary cases of seborrhea of the scalp, or other parts of the body, it alone generally suffices as a local remedy, if the surface be occasionally washed with water and soap. It may be combined with an equal quantity of the fluid of oleate of mercury, oleic acid, glycerin, or a fifty per cent. solution of boro-glyceride, and scented with some agreeable essential oil. It will often be of advantage to stimulate the parts, by the addition of a small quantity of phenol, balsam of Peru, or similar substances. Olive oil or oil of sweet almond, and other bland oils may also be used for removing the sebum and scales; but they do not possess the medicinal qualities of the oil of ergot. In severe cases, in which the sebaceous material is thick and caked on the scalp, it may be necessary to saturate the parts with oil in order to soften the mass. The application should be made just before retiring, and the head covered with a flannel cap, and then protected with a bandage or, even better, oiled silk. On arising, the dressing should be removed, and the scalp washed with water and soap. Soft or potash soap, or spirit of soap, is usually recommended, but I have found soda soap, particularly when medicated with chamomile and sulphur, to be sufficient. If the sebaceous material reform, the application should be repeated. Lotions occasionally prove effective and are to be preferred to oils in seborrhea oleosa, especially of the face. One or two grains (0.06 or 0.12 gm.)

of corrosive sublimate to the ounce (32 gm.) of rose-water or of almond emulsion, is an excellent application. Betanaphthol, in from three to five grains (0.18 to 0.30 gm.) to the ounce (32 gm.) of water, is also valuable. Equal parts of glycerin and alcohol, or a fifty per cent. solution of boroglyceride have been found serviceable. Benefit has also been derived from a fifty per cent. solution of bicarbonate of sodium. Pincus recommends lotions containing lactic or citric acid. Others prefer acetic acid, solution of ammonia, or liquid phenol. Resorcin is advised by Ihle, who uses it dissolved in olive oil, castor oil, or balsam of Peru, some of the preparation being rubbed into the scalp every day with friction. A solution of ichthyol or of sodium ichthyol sulphonate, in water or in alcohol and ether, is sometimes of advantage. The conjoined internal and external employment of pilocarpus has likewise been proposed. Treatment should begin early in order to prevent baldness:

The following formulæ are also recommended:

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| ℞ | Tinct. nucis vomicæ | f℥ss. | 16. | |
| | Chloral. hydratis | gr. xx. | 1.30 | |
| | Tinct. capsici | fʒij. | 8. | |
| | Spts. rosmarini q. s. ad. ft. | f℥iv. | 128. | |

M. Sig.: Apply night and morning.

| | | | | |
|---|---|---|---|---|
| ℞ | Tinct. quillajæ | f℥jss. | 48. | |
| | Tinct. capsici | f℥ss. | 16. | |
| | Sp. odorati | f℥jss. | 80. | |
| | Glycerini | f℥ij. | 64. | |
| | Ammon. carb. | ʒj. | 4. | M. |

| | | | | |
|---|---|---|---|---|
| ℞ | Sp. etheris | f℥iij. | 96. | |
| | Tinct. benzoin | fʒij. | 8. | |
| | Vanillin | gr. ss. | .03 | |
| | Heliotropin | gr. jss. | .09 | |
| | Ol. geranii | ♏ ij. | 0.12 | M. |

Spirit of ammonia, tincture of cantharides, and other stimulating substances are useful in the form of lotions. Lime-water also is frequently of service.

Ointments are sometimes beneficial, especially if bland medicaments are required. As a rule, they seldom yield good results on the scalp and hairy parts of the body; they mat the hair together, and do not always reach the diseased scalp. In some cases, the judicious employment of mercury is beneficial. The ointment of mercuric oleate, well rubbed in, either alone or combined with betanaphthol or one of the tarry preparations, is the most effective. Those of the nitrate and the ammoniated and the red oxide of mercury are worthy of trial. The annexed formula has been prescribed with excellent results:

| | | | |
|---|---|---|---|
| ℞ | Ol. anthemidis | ♏ x. | 0.60 |
| | Quininæ tannatis | gr. xv. | 1. |
| | Ungt. acidi borici | ℥j. | 32. |

M. Sig.: Rub in a small quantity once or twice daily.

A useful formula for an ointment is:

| | | | | |
|---|---|---|---|---|
| ℞ | Acid. salicylici | ʒss. | 2. | |
| | Sodii boratis | gr. xv. | 1. | |
| | Balsami Peruviani | ♏ xxv. | 1.55 | |
| | Ol. anisi | ♏ vj. | .36 | |
| | Ol. bergamii | ♏ xx. | 1.33 | |
| | Ungt. aquæ rosæ | ℥j. | 32. | M. |

Zinc or lead ointments, with or without opium, may be demanded, if there is much irritation or inflammation of the skin.

In seborrhea sicca of the scalp, Vidal advises the following preparation: Precipitated sulphur, fifteen parts; castor oil, fifty parts; cacao-butter, twelve parts; balsam of Peru, two parts. The ointment should be rubbed into the hairy scalp every morning and evening.

Sulphur is highly esteemed by French dermatologists, and is applied in the form of powder, lotion, or ointment.

In seborrhea oleosa, Piffard has seen advantage result from the use of the constant electric current. He also recommends two to four per cent. solutions of hydrochloric, or chromic, acid and precipitated silica, made by adding a dilute solution of silicate of soda to dilute hydrochloric acid.

Purified wool-fat, or lanolin, is an excellent excipient for ointments in this affection.

Other serviceable ointments in the treatment of seborrhea are those containing hamamelis, hydrastinine, arsenic oleate and iron oleate.

Powders which have a combined astringent and soothing action are serviceable in the oily form, about the face, and in seborrhea of the prepuce. They can be used alone, or in connection with a lotion or ointment. Powdered zinc oleate, mixed with an equal quantity of arrow-root, starch, or bismuth subnitrate, forms an excellent application. Salicylic acid may be usefully added to any of these powders.

The local treatment of seborrhea of other parts of the body is similar to that of the scalp. The sebaceous material, if accumulated, should be removed in the manner already described, and suitable applications then be made. The selection of remedies and the frequency of their application—whether daily, once or twice a week, or every few days—will depend upon the variety of disease and the condition of the affected surface. In cases in which soap and water increase the irritation, their use must be avoided. Radiation, with slight stimulation, is useful. Sunlight acts as a convenient substitute for the x-ray apparatus. When accompanied by acne rubra of the face (acne rubra seborrheicum), salophen, and salicylic acid in ointments, give excellent results. They should be weak at first and gradually increased.[1]

**Prognosis.**—Seborrhea is a chronic but generally curable disease. It may at times disappear spontaneously, or yield rapidly to treatment. Again, it may prove obstinate, requiring a prolonged course of treatment. If it involves the scalp, or other hairy parts of the body, or has continued for some time, temporary and not infrequently permanent loss of hair may follow. The prognosis is very unfavorable in cases in which the entire surface is involved, and also in those afflicted with carcinoma and tuberculosis.

## COMEDO.

SYNONYMS.—Black-heads, Grubs, or Magot-pimples.

Comedo is a disease of the sebaceous glands, due to retention of sebum within the follicles, and marked by the appearance of whitish, yellowish, or blackish points at their orifices.

**Symptoms.**—Comedones vary in size from a pin's point to a pin's head, or larger. They may be elevated or non-elevated, more or less numerous, and irregularly distributed on the skin. They are situated, as a rule, about the face, neck, chest, and back. The face, especially the forehead, nose, and chin, is usually involved, being studded with black points, and often also presenting a greasy and muddy appearance.

In some cases double comedones have been observed. In these a communication exists between the ducts of neighboring glands, or a duct may bifurcate before reaching the surface. Dr. George Thin has described cases of grouped comedones in which the occluded ducts are so closely grouped upon defined areas of the face as to give a uniform dirty-black appearance to the part affected. H. Radcliffe-Crocker has met with several cases in which grouped comedones were symmetrically arranged upon both sides of the face. In rare instances comedones occur on all portions of the body except the hands and feet. The disease is frequently accompanied by acne and by seborrhea oleosa, and inflammatory symptoms will at times result. It occurs chiefly in the young of both sexes, especially about the age of puberty. The course of the disease is very slow, disappearing, to again reappear, it may be for years, unless checked by appropriate treatment.

**Diagnosis.**—Comedo might possibly be mistaken for acne punctata, but inflammatory symptoms exist in the latter which are not usually present in the former disease. The differentiation between comedo and milium is referred to under the latter affection.

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[1] Engman and Moore: Journal of the American Medical Association, Aug. 31, 1907.

**Pathology.**—The disease develops in the sebaceous glands and follicles, and consists in the retention of sebum and epithelial cells leading to the dilatation of the openings upon the surface. The black point upon the skin is generally ascribed to dirt, but Unna states that it is produced by pigment. The formed comedones rarely excite any inflammation, and if removed and examined are found to consist of sebaceous matter, epithelial cells, free fat, occasionally one or more small hairs, dirt, and at times the animal larval parasite known as the *Demodex folliculorum.* The latter parasite, however, is not regarded as an active causative element in producing the disease. Other forms of micro-organisms are invariably present, and the whole collection is inclosed by a layer of stratified horny cells. According to the latest researches, the original cause of a comedo is a hyperplasia of the cells of the corneous layer—that is, a hyperkeratosis —in and about the sebaceous follicles, causing irritation with increase and retention of secretion, leading to more or less dilatation of the follicles.

**Etiology.**—The increased physiological activity of the glands and development of the hairs at the age of puberty are provocative of the disease. Chlorosis, scrofula, and menstrual disorders and affections of the gastro-intestinal canal, very often assist in its development. Indulgence in rich greasy food, with resulting fermentation of intestinal contents and formation of toxins, may be an important factor. According to Piffard, comedones at times have their origin in masturbation. In fact, it may be brought about by the functional derangement of any of the organs of the body, including the skin, and its causes are essentially the same as those of acne. The action of local irritants, as in certain occupations, often give rise to the disease. This result will frequently be seen in those working in tar, among chemicals, dyes, wool, etc.

**Treatment.**—Constitutional and local treatment are of advantage. Chlorotic subjects are benefited by codliver oil, iron, the simple bitters, with occasionally saline aperients. An appropriate diet and proper hygiene are of the greatest value in all cases. Dyspepsia, constipation, and uterine disorders should be corrected by suitable treatment. Ergot, and the tincture of the chloride of iron, or dilute phosphoric acid, alone or combined, can often be employed with good results, especially in weak and nervous patients. Local treatment is all-important for the purpose of removing the offending plugs and stimulating cutaneous activity. The comedo-plugs, if a source of annoyance, from the deformity which they occasion, can best be removed by nicking the side of the follicles and scooping out with a needle-knife, or gently pressing the contents. If an attempt is made to remove them by squeezing the comedones between the fingers, or by applying a watch-key over them, and by violent pressure forcing out the contents, the delicate epidermis may be lacerated and infection and inflammation result. The use of soap and hot water, followed by friction with rough towels once or twice daily, affords most excellent results. Medicinal soaps can also be advantageously employed, especially sulphur, chamomile, ergot, salicylic acid, and sublimate, either in the form of potash or, even better, soda soap. Soap combined with alcohol, or any one of the spirits, notably spiritus saponis kalinus, of Hebra, official as linimentum saponis mollis (U. S. P.), is likewise effective. Stimulating lotions containing corrosive sublimate, one of the tarry preparations, sulphur, borax, bicarbonate of soda, or sulphate of zinc, are well borne and yield good results.

The French are much in the habit of employing camphorated alcohol or spiritus camphoræ diluted. Professor Hardy recommends a solution of alum, and Brocq has often obtained satisfactory results from the use, night and morning of a decoction of quillaja or saponaria-root, to which is added a drachm (4 gm.) of Cologne water and half a drachm (2 gm.) of water of ammonia.

I herewith give a formula that has proved useful in my private and hospital practice, and is well worthy of trial:

| | | |
|---|---|---|
| ℞ Thymol | gr. x. | 0.6 |
| Acidi borici | ʒij. | 8. |
| Aquæ hamamelidis | f℥iv. | 128. |
| Aquæ rosæ | f℥j. | 32. |

M. Sig.: Mop well over the surface once or twice daily.

The appended is also a very good application:

| | | |
|---|---|---|
| ℞ Sol. boro-glyceride (50-per-cent. solution), | | |
| Spts. vini rectif. | āā f℥ij. | 64. |

M. Sig.: Rub well into the part with flannel.

The various stimulating ointments, particularly those containing sulphur, borax, Peruvian balsam, tar, and the mercurials, or an ointment composed of one part of carbonate of ammonium to eight parts of simple cerate, may be used when soaps or lotions are not suitable. If the part has unfortunately been over-stimulated, and the skin assumes a rough and inflamed appearance, soothing and slightly astringent ointments or dusting-powders should be employed, among the best of which is a mixture of equal parts of oleate of zinc and finely powdered talc. Massage of the skin increases the local circulation. For the same reason galvanism or faradism may also be employed. The massage may be used daily, combined with hot water applications; the electricity may be applied twice a week.

**Prognosis.**—Favorable results invariably follow well-directed efforts to remove the disease. Relapses may occur if the exciting cause remains, but persistent treatment will restore the skin to its normal condition.

## MILIUM.

SYNONYMS.—Grutum—Strophulus albidus—Acne albida—Tubercula miliaria—Tubercula sebacea.

Milium consists in the development of small, round, whitish formations, located beneath and covered by the epidermis.

**Symptoms.**—Milia appear as small, round, flat, or acuminated bodies, usually situated on the face, particularly about the upper eyelids, cheeks, and temples. They may occur, however, on other portions of the body, especially on the penis and scrotum. They may or may not be elevated, and are hard and firm to the touch; in size they vary from a pin's head to a small pea, but commonly they are about that of a millet-seed, from which they derive their name. They are whitish, translucent, pearl, or yellowish in color. They may appear singly or multiple, but are ordinarily observed as several—usually four to twelve—upon one of the regions named. They develop, as a rule, slowly, and, after reaching a certain size, remain for years. They occur more frequently in women than in men, particularly at and after adult age. Milium may exist alone or occasionally in connection with other eruptions, as acne, comedo, lupus and syphilis. The lesions give rise to no subjective symptoms, but, simply by their presence, especially when on the face, occasion more or less deformity.

**Diagnosis.**—Milia may resemble comedones, from which, however, they may be distinguished by their anatomical formation. Milium, anatomically, is a very small sebaceous tumor, covered with epidermis; while comedo is simply a dilatation of the duct, with a retention of the secretion, and a free or open extremity.

Occasionally the retained material of milium undergoes calcification. The little tumor then feels hard and constitutes, in fact, a cutaneous calculus.

Milia usually project from the surface, and occur as the sole disease; comedones, on the other hand, have a smooth surface, with prominent black points, and generally coexist with acne or some other eruption.

**Pathology.**—Milium is thought by many investigators to consist in a retention of the sebaceous secretion, together with an obliteration of the aperture of the gland. An incision through one of the formations will demonstrate that it lies beneath, and is covered with, the epidermis. Virchow and Rindfleisch believe that the cysts proceed from the hair-follicles. Robinson also states that he considers a milium, where superficially located and under certain circumstances, may be a case of wandering embryonic epithelium from a hair-follicle or from the rete.

**Etiology.**—The origin of this disease is in many cases unknown. It may arise from a constitutional derangement, or local source of irritation.

**Treatment.**—The free use of soap and water, especially the potash soap, will often cause milia to disappear. The best and most radical treatment is by means of the knife. A small incision in conjunction with an application of Monsel's solution, hydrogen dioxide, or the tincture of iodine will insure their destruction. They may also be removed by electrolysis.

## CYSTIS SEBACEA.

SYNONYMS.—Steatoma—Atheroma—Sebaceous cyst—Sebaceous tumor—Follicular tumor—Encysted tumor—Wen.

Sebaceous cyst is a prominent, roundish, or semiglobular tumor, situated in the skin or subcutaneous tissue.

**Symptoms.**—Sebaceous cysts or wens consist of an extraordinary quantity, and a slowly increasing accumulation, of the secretion in the sebaceous glands. They are met with chiefly upon the scalp, forehead, eyelid, neck, shoulder, back, buttocks, and scrotum. They may occur singly, as is usually the case, or be multiple. An unusual case of such multiple development has been described by Professor Chiari.[1] The patient was a man seventy-four years of age. The tumors were of all sizes, from an almost imperceptible nodule to that of a walnut. In some regions more than twenty were counted within an area of about four square inches.

They vary in size from a pea to a small orange, and are semi-globular, rounded, or flattened in shape. They may be firm, soft, or fluctuating in consistency, according to the condition of the retained material. They are usually freely movable upon the underlying tissues; but this depends upon their age, size, and the condition of the tissue in which they are seated. The overlying skin is either normal or paler in color, from the compression of the blood-vessels. It may be devoid of hair, and, in the aged, rough, red or greasy in appearance. The orifice of the gland-duct may remain patent in some and be obliterated in others. They are unattended by pain, slow in their development, and often remain for years without producing annoyance. Occasionally, however, they inflame, suppurate, and ulcerate, giving rise to an offensive discharge. The periods at which they most frequently appear are childhood and middle age; instances, however, have been known where they have existed before birth. They are also said to be hereditary.

The disease described as adenome sebace circonscrit, or circumscribed sebaceous adenoma, by French authors, is not, properly speaking, a tumor but is a superficial lesion of the skin, produced by the agglomeration of a number of papules into groups. These patches vary from one to eight centimetres in diameter. Their outlines may be irregular, forming linear, oval, or quadrangular lesions. The color is variable red, brown or yellow. The surface is uneven, indurated or ridged, according to circumstances. The orifices of the glands are obstructed by scales and project under the pressure of enclosed sebaceous matter. The consistency is altogether firm or flabby. The epidermis is smooth. The groups are notably circumscribed and sharply defined from the healthy integument. There are no nevi or telangiectases. The preferred site is on the head, especially the forehead, temples, nose and cheek. No pain nor itching attends the eruption, which progresses very slowly, requiring several years to attain a small dimension. The plaques rarely, if ever, ulcerate, although exposed to traumatism and to infection. The disease usually occurs in male adults. Histologically, the lesions forming the patches are enlarged or hypertrophied sebaceous glands, with normal formation. The follicles of the glands are dilated and often form cysts. The hair follicles disappear. The skin and neighboring connective tissue are normal. These lesions are adenomatous and not simple retention cysts. They may begin early in life, and Audry[1] considers them related by nevus in general, and sebaceous nevus particularly.

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[1] British Medical Journal, April 12, 1890.

**Diagnosis.**—Sebaceous cysts are liable to be confounded with fatty tumors. The latter, however, seldom invade the scalp, have more of a doughy consistence, their degree of mobility is slight, and they may attain a very large size. In case of doubt as to the diagnosis, an incision should be resorted to. They may also resemble gummata and osteomata. Gummata are usually attended by other syphilitic lesions, and are both of rapid growth and painful; but are not as freely movable as the sebaceous tumors. Osteomata are hard and immovable; while sebaceous cysts are soft and movable.

**Pathology.**—A wen is a cystic tumor, caused by retention of the secretion within the gland. It consists of a strong sac and its contents—the sac being formed by a distention of the gland, producing more or less hypertrophy of its walls. The contents are variable both in color and consistence—whitish, yellowish, or grayish, and hard and friable, or soft, cheesy, and fluid—and composed of sebum, epidermic cells, cholesterine, with occasionally a hair. The cyst may break down, and be attended with a scanty discharge of a fetid odor, or be partially or entirely filled with calcareous matter.

**Treatment.**—The most certain remedy is excision. The operation, however, should be performed only when the system is in good condition, or after proper preparation has been made for it. If this precaution be not taken, erysipelas may follow with dangerous and possibly fatal results. After incision, the cyst-wall should be entirely torn or dissected out; otherwise, the growth may return. The cyst may also be destroyed by caustic applications or injections of iodine, phenol, or other irritating substances.

A convenient and successful method, according to a writer in the

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[1] Chas. Audry: Annales de Dermatologie et de Syphiligraphie, July, 1903.

"British Medical Journal," consists in puncturing the cyst with a Graefe's cataract-knife, gently expressing the contents, and afterward introducing a very small piece of nitrate of silver. On the following day, by means of a pair of forceps, the capsule of the cyst can be withdrawn without any portion being left adherent. It is stated that in no case has this procedure been followed by return of the growth or ill effects. Where an operation cannot be performed, a small opening may be made and the contents expressed gently, and the sac washed out with hydrogen dioxide daily. Artificial gastric juice may be injected into the sac. Injection of ether into an unbroken sebaceous cyst has been reported to have been followed by its disappearance by absorption. For the form known as circumscribed sebaceous adenoma, the treatment is extirpation.

**Prognosis.**—As a rule, the prognosis is favorable. Fatal results may happen in the aged and debilitated, but seldom when they have been prepared for the operation.

## ANIDROSIS.

SYNONYMS.—Hypohidrosis—Decrease, or complete cessation, of the secretion of sweat.

Anidrosis is a functional disorder of the sweat-glands, characterized by a decrease or complete cessation of their secretion.

**Symptoms.**—Anidrosis may be idiopathic or symptomatic, general or local. It may be congenital or hereditary, there being a diminution or an absence of sweat, under circumstances which generally make the sudoral secretion most active. Examples of general idiopathic anidrosis are to be observed in ichthyosis. The skin in these cases is harsh and dry, and the palmar and plantar surfaces are thickened, fissured, and at times painful. This condition may be temporarily produced by certain drugs, such as belladonna, and the solenaceous alkaloids generally.

**Symptomatic Anidrosis,** which is far more common, may be either general or local, and may occur from the impairment of the nervous system, or during the course of other cutaneous affections such as eczema, psoriasis, lichen rubra, and leprosy. It may be temporary, as in fevers and neuralgias, or it may be permanent, as it is sometimes in diabetes, carcinoma, and tuberculosis. The skin, whether the disease be general or local, temporary or permanent, is dry, rough, and often the seat of itching, burning, and other distressing sensations. Occasionally, a sudden arrest of the functional activity of the sweat-glands may give rise to more or less unpleasant constitutional symptoms.

An allusion may not inappropriately perhaps be made in this place to a condition described by E. C. Perry under the title of "Adenoma of the Sweat-glands." A woman had for twenty-one years been afflicted with white, firm papules upon the face. The lesions varied in size from that of a millet-seed to that of a pea, were painless, and had never ulcerated.

There was no seborrhea, and the secretion of sweat from the head and face had decreased. The sweat-glands were enormously enlarged. The swellings were pricked with a needle and then removed with scissors or scalpel. The result was a complete cure.

**Treatment.**—Exercise in the open air, or massage, is to be advised. The general health should also be corrected. Baths—the cold, hot, steam, hot-air, or Turkish or Russian—with friction of the skin, are to be commended. Diaphoretics are advisable. The most valuable are the fluid-extract of pilocarpus, in the dose of from a few drops, to one or two drachms (4 to 8 gm.), or its alkaloid, hydrochloride of pilocarpin in from one-tenth to one-half grain (0.006 to 0.003 gm.). Free diaphoresis will soon follow, and continue for several hours. From its tonic influence upon the glands of the skin, nux vomica is useful in this disorder. Emollient ointments or oils will often be required when the skin is dry and fissured. Lanolin, alone or combined with a few drops of volatile oil of eucalyptus, forms an excellent application. The use of dilute glycerin will also sometimes serve a good purpose.

## HYPERIDROSIS.

**Synonyms.—Ephidrosis—Hydrosis—Idrosis—Sudatoria—Increased secretion of sweat.**

Hyperidrosis is a functional disorder of the sweat-glands, characterized by increased sweating.

**Symptoms.**—Hyperidrosis may be either acute or chronic. It may be general, in which the entire body is affected, or local, and limited to certain regions. *General sweating* may occur in healthy individuals from nervous excitement, or from an increase in the surrounding temperature, especially in corpulent persons. It is often liable to appear in connection with tuberculosis, pneumonia, rheumatism, malaria, and certain nervous febrile, and debilitating diseases. The temperature under such circumstances may rise or fall. It may also follow the administration of certain medicines, such as pilocarpus, spirits of Mindererus, Dover's powder, etc.

Long-continued hyperidrosis may depend upon anemia. In this case, according to Hebra, warty thickenings, corns, or callosities always form upon the palms and soles. The fingers may assume a drumstick form, and the nails become large and broad.

*Local hyperidrosis* may occur upon any part of the body, but the scalp, face, axillæ, genitals, and palmar and plantar surfaces are most frequently involved. It may be temporary, continuous, intermittent, or periodical. It may be symmetrical or unilateral. Many cases have been recorded in which, owing to some derangement of the nervous system, unilateral sweating occurred even on the opposite side of the body. It may be slight, or so excessive as to saturate the clothing and macerate the integument. In the axillary region, the poured-out sweat, mingling with the sebaceous secretion, particularly in women, discolors and destroys the clothing, creating a most disagreeable and offensive odor. The same annoying, and occasionally even more vexatious effects follow from hyperidrosis of the genital regions. In the involvement of the palms and soles, the sweat may exude in drops, collect on the surface, and flow in quantity from the members. The palms when affected are bathed in a profuse perspiration, even after drying. The secretion can often be seen issuing from the ducts as a clear or yellowish fluid. The amount varies according to the condition of the health and the state of the temperature.

The skin presents a white, wrinkled, and macerated appearance, and the parts are cold and clammy to the touch. Identical and often even more severe symptoms occur in hyperidrosis of the soles. The stockings and shoes, or boots, become saturated with the secretion, the material of which decomposes, adding a further source of irritation to the parts. The skin becomes macerated, sodden, fissured, especially in the flexures of the toes, and strips off, exposing a delicate and tender surface beneath.

In a case under the care of Vidal, hyperidrosis of the foot was so excessive as to cause confluent vesicles with the eventual formation of bullæ as large as an egg at several different points.[1]

A disagreeable odor attends the patient, which may pervade the room in which he sits, and the pain and suffering may be so severe as to interfere partially or entirely with walking. (See also Bromidrosis.)

Hyperidrosis may at times be attended with itching, burning, pricking, tingling, or other unpleasant sensations. It is often a most obstinate and persistent disorder, occurring in both sexes, and usually more severe in summer. It may give rise to other skin affections, especially eczema.

**Diagnosis.**—The diagnosis is usually easy, but the disease may resemble seborrhea oleosa and prickly heat. In seborrhea oleosa, the poured-out secretion is oily, and in prickly heat vesicles are formed, with attendant surrounding inflammation; in hyperidrosis the secretion is serous, and vesicles and inflammation, as a rule, are absent.

**Pathology.**—In a case of phthisis, attended with hyperidrosis, Virchow observed that the glands were enlarged, with fatty degeneration of the epithelium. The sweat-glands and tissue of the part involved, however, are not usually changed in the least.

**Etiology.**—Hyperidrosis may sometimes be congenital and hereditary. Functional or organic disease of any of the organs, or a derangement of the nervous system, is often the exciting cause. A nervous influence has frequently been noted to be active in occasioning it. The direct cause can not be ascertained at times, even after careful examination into the condition of the system. It has been attributed to masturbation.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, May, 1888.

Hyperidrosis of the hands is apt to occur in those who are in the daily habit of using spirituous and malt liquors to excess.

**Treatment.**—The treatment should be appropriate to the case under consideration. If the cause of the disease can be detected, it should be removed or counteracted. Lung, heart, and kidney affections, or hysteria, neurasthenia, anemia, chlorosis, scrofula, or syphilis, may underlie hyperidrosis, and they should receive the treatment necessary for each individual case. There are a number of remedies which may be employed in arresting excessive perspiration, but their effect, as a rule, is only temporary. Geber refers to the value of white agaric (0.1 to 0.5 gm.), the extract of aconite (0.03 to 0.06 gm.), and to infusions of salvia leaves, elder flowers, also the aqueous extract of strychnine, phenol and salicylic acid. Jaborandi leaves are of service, as well as pilocarpin and atropia. The latter is probably the most effective and certain general remedy; it may be given hypodermically, in from one-eightieth to one one-hundred-and-sixtieth of a grain (0.0008 to 0.0004 gm.). Ergot, in the form of the fluid extract, and faradization have also been followed by good results. Tannic or gallic acid, quinine, sulphuric acid, and digitalis are other constitutional remedies which have been employed. Badlände[1] recommends alcohol in excessive perspiration, on account of finding that this agent diminishes the temperature of the skin and the transpiration of fluid, during the course of his experiments.

The phosphate of calcium has sometimes been advantageously used. When the superabundant secretion seems to depend upon disorder of the nervous system, valerian, the bromides, and the cold douche may prove of service. Rheumatic and gouty patients in whom hyperidrosis is present may be benefited by the administration of the iodides.

Local treatment is essential in curing or relieving the disease. The too frequent use of water in the form of baths (as in soaking the feet), or applied directly to the part, simple or medicated, is not usually attended with the best results. In its mildest forms, the occasional use of water, as hot as the surface can bear, with betanaphthol, corrosive sublimate, sulphur, or tar soap, is often productive of good. In light and severe cases, dusting-powders are well borne, either alone or after the application of water. Zinc oleate, salicylic acid, and naphthol are perhaps the most useful of all powders. The following I have found of service:

| | | | | |
|---|---|---|---|---|
| ℞ | Pulv. zinci oleatis | ʒiij. | 12. | |
| | Pulv. amyli | ℥ss. | 16. | M. |
| ℞ | Acidi salicylic, | | | |
| | Bismuth subnit. | āā ℥ss. | 16. | M. |
| ℞ | Betanaphtholi | gr. xix. | 1.30 | |
| | Acidi borici | ℥ss. | 16. | M. |

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[1] Zeitschr. f. klin. Med., Bd., xiii, Heft 5.

As soon as the powders become moist they should be removed with sweet-oil and fresh powder reapplied. Care should be exercised to avoid having the affected part too warmly covered or too well protected. This condition is frequently observed among women who wear rubber or oil-skin shields in the axillæ to protect their clothing, and in men who apply varicocele-bags or suspensories, and other means of protection around the genital organs. These articles often cause the secretions to be retained, and produce an inflammation of the skin. Lotions are frequently effectual. They may be aqueous or spirituous, and contain tannic acid, camphor, sulphate of zinc, acetate of lead, acetic, sulphuric, boric, and salicylic acids, corrosive sublimate, perchloride of iron, or other drugs. Ten grains (0.60 gm.) of corrosive sublimate, in four ounces (128 gm.) of Cologne-water or distilled witch-hazel forms an elegant and useful application. Alum, one or two drachms (4 to 8 gm.) to the pint (512 gm.) of water, or alcohol, may also be employed. The tincture of belladonna is said to be a valuable remedy. A one-per-cent. aqueous solution of chromic acid is often very effective in hyperidrosis of the feet. A piece of lint saturated in the solution should from time to time be applied to the soles and the spaces between the toes. An excellent lotion consists of hydrochloride of hydrastinine in the strength of two to six grains (.12 to .36 gm.) to the ounce (32 gm.) of water or distilled witch-hazel. An infusion of soap-bark is also efficacious. A ten- to twenty-per-cent. solution of formalin in alcohol has been used with good effect. Tannoform, a mixture of formalin and tannin, is a beneficial dusting-powder. Unna recommends that before going to bed the patient should bathe the parts in hot water containing camphor, mustard, or vinegar, after which an ointment of turpentine or ichthyol, each five parts to ten parts of oxide-of-zinc ointment, should be applied. In the morning the ointment should be washed off, cold water be rubbed upon the surface until redness and warmth are produced, and then dusted with a powder containing mustard-flour.

In obstinate cases, involving the feet, Hebra obtained good effect from the application of diachylon-ointment. The ointment is spread upon pieces of linen sufficient to cover each foot, likewise on separate pieces to be placed between the toes. The entire foot is then covered with linen, bandaged, and the stocking and shoe put on. The same procedure is repeated each day for one or two weeks. The upper layer of the skin in the course of a few days after treatment begins to be cast off; after this is complete the feet are washed and powdered, the latter process being continued for some weeks after the ointment.

Stewart advises that after bathing the affected parts with warm water, they should be washed with a weak solution of permanganate of potassium, then dried, and, when the hands and feet are involved, that they should be enclosed in bandages spread with lead carbonate (in paraffine ointment or benzoinated lard). The plaster is to be renewed every twelve hours during ten to sixteen days. Thymol may be added to the permanganate solution with advantage. Chloral in ten per cent. solution, or a weak solution of chlorate of potassium, has also been recommended as useful in this affection.

Salicylic and boracic acids, lead oleate, and betanaphthol likewise form valuable ointments.

An ointment of hydrastinine or aluminium oleate can also be recommended. Of late I have used powdered cinchona bark, thymol iodide or aristol[1] with very satisfactory results. Upon sweating feet it may be used alone as a dusting-powder. In other localities I have mingled it with the impure carbonate of zinc, or have prescribed it in the form of an ointment made up with the oxide of zinc, or subacetate of lead.

Lint and absorbent cotton, with or without medication, are also useful. Robinson endorses the use of borated absorbent cotton without other adjuncts.

Another good plan is to dust subnitrate of bismuth freely into the stockings or gloves. The stockings, which should not be woolen, should be changed once or twice daily. Galvanism applied once a day to the affected parts, using from 15 to 20 milliampéres, is often curative. Professor Kromayer recommends, in the Berliner Klinische Wochenschrift, the employment of the x-rays in hyperidrosis of the hands. He had observed that the hands of men working with the rays were usually very dry and thus came to the conclusion that the rays might be efficacious in cases of profuse perspiration. He has obtained good results from exposures of about ten minutes' duration repeated several times at intervals of some days. A slight dermatitis is produced after which the sweat-glands become atrophic.

**Prognosis.**—Hyperidrosis in many cases can only be alleviated. The disease is obstinate and unyielding to the best-known methods of treatment. If the cause can be discovered and removed, the prognosis is favorable. A cure, however, and very often relief, is not obtained, owing to the patient neglecting to thoroughly carry out the treatment advised. Sometimes a change of occupation or of residence is beneficial.

## BROMIDROSIS.

SYNONYMS.—Osmidrosis—Stinking sweat—Odorous sweat.

Bromidrosis is a functional disorder of the sweat-glands, characterized by the evolution of an offensive or disagreeable odor from the skin, generally accompanied with increase of sweating.

**Symptoms.**—Bromidrosis may occur either as a general or as a local disorder. (1) If general, it may be a physiological condition, as is the case in the negro, and occasionally in persons of other races. The exhalation may have a characteristic odor, as of decayed cheese, putrid flesh, urine, or rancid, goaty, or sour; or like that of onions, asafetida, musk, sulphur; or it may have a peculiar sweet smell, like violets or pineapples. A distinctive scent occurs in certain diseases, as in the fevers in which it is ammoniacal; in scurvy putrid; in syphilis sweet; in rheumatism acid; in jaundice and peritonitis musky. In nervous affections, also peculiar odors have been noted to occur. Hamilton recording for instance, that of violets perceptible in a lady of hysterical disposition. The ingestion of certain articles of food and drugs may give rise to other odors. (2) The local forms of bromidrosis are the most common, especially upon those portions of the body abundantly supplied with sweat-glands, as the axillæ, groin, genital regions, and feet. The odor may vary in degree as well as character, for instance, from being slight and hardly apparent, to being so penetrating and offensive as to interfere with the person's social duties and his intercourse with his fellow-man. It often causes individuals to be shunned by those they come in contact with in their occupation, as well as in social life. The disorder is more severe in the summer than in the winter months. It may occur at all ages, but is more frequently encountered in middle life. The feet, which are the most frequently affected, exhale a most offensive odor. The disorder is mostly symmetrical. The skin, from the irritating action of the decomposed secretion, which is retained in the stockings and shoes, becomes red, excoriated, and tender, or whitish and sodden, and is sometimes so painful as to interfere with walking. The skin has a flabby macerated appearance, in the affected regions.

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[1] See paper on "Aristol," by the author, in the Medical Bulletin for June, 1891, p. 201.

Bromidrosiphobia is a term employed by Piffard to denote that the odor complained of is subjective and referable to perverted sensitiveness of the olfactory organs. Two cases of this disease are reported by him. It is a form of morbid fear, several varieties of which are known to alienists.

**Etiology.**—The disorder is frequently connected with some nervous derangement. At times it will be found impossible to trace it to any assignable cause. It may be purely mental or psychic. In some instances it is connected with indiscretions in diet, especially such articles as fried potatoes and meats in large quantity.[1] Excessive use of alcohol and tobacco are two great etiologic factors.

**Treatment.**—Bromidrosis, if physiological, may be relieved by frequent ablutions with water and soap, the betanaphthol and phenol soaps being serviceable. The same may be said of eucalyptus soap. The under-garments should be changed often. When it is dependent upon disease, particularly of the nervous system, it should be counteracted by appropriate treatment. Digestive disorders should be corrected, and the diet regulated. A skimmed milk diet for a week or two is advisable. The bowels should be kept open and free from fermentation. Small doses of pilocarpin by the mouth, or hypodermically, are also of advantage. The local forms are treated principally in a similar manner to hyperidrosis. There are, however, certain remedies which are particularly efficacious, and to which special attention is called. Betanaphthol, boric and salicylic acids are valuable agents, used in the form of lotions or ointments. From ten to thirty grains (0.60 to 2 gm.) of either in an ounce (32 gm.) of water, alcohol, lard, lanolin, or suet, form suitable applications. Sulphate of zinc ointment in the same strength is efficacious in removing the offensive odor. An ointment of alum containing thirty or forty grains (2 to 2.60 gm.) to the ounce (32 gm.), or of aluminium oleate mixed with equal parts of lard is of service. The sulphate or acetate of copper in the form of ointment or lotion or the oleate made into a ten- or twenty-per-cent. ointment may be advantageously employed. Hydrastinine-ointment, five to thirty grains (0.30 to 2 gm.) of the hydrochloride in an ounce (32 gm.) of excipient diminishes fetor. Thin recommends, in bromidrosis of the soles, the wearing of cork-soles within the shoes; the cork to be soaked, as well as the stockings, in a solution of boric acid, and thoroughly dried before wearing. A fifty-per-cent. solution of boroglyceride, alone or rubbed up with carbonate of lead or zinc, often acts well. The permanganate of potassium, or chloral hydrate, from five to thirty grains (0.30 to 2 gm.) to the ounce (32 gm.) of water, alcohol, or tincture of witch-hazel, may have a beneficial effect. Solutions of oxalic acid, ten to twenty grains (0.60 to 1.30 gm.) to the ounce of water, or chloride of zinc, three to ten grains (0.18 to 0.60 gm.) to the ounce (32 gm.), may also be recommended. The local application of tincture of iodine has likewise been found successful in some cases. Among other lotions which may be employed with more or less benefit may be mentioned lime-water, and the infusion of quillaja, or soap bark. The hands or feet may be bathed in the former fluid every day or every other day, while the face or axillæ may be washed with a sponge which has been dipped in the infusion.

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[1] Case reported in Clinical Lecture by the author, Medical Bulletin, Philadelphia, May, 1907.

The following formula is highly recommended by Tshappe:

| | | |
|---|---|---|
| ℞ Zinci sulphat., | | |
| Ferri sulphat. ..................āā | 450 | grammes. |
| Cupri sulphat. .................... | 150 | " |
| Betanaphthol ...................... | 1-5 | " |
| Olei thymi ........................ | 3-5 | " |
| Acidi hypophosphorosi ............ | 5-7 | " |
| Aquæ destillatæ ................... | 2500 | " |

The various dusting-powders, especially the oleate of zinc, salicylic acid, purified talc with boric acid and powdered red cinchona, singly or combined, either with or without lotions, often afford much relief.

When the primæ viæ and adnexa are in a disordered condition, the following may be given after each meal and at bed time:

| | | |
|---|---|---|
| ℞ | Creosoti (beechwood) | ♏ij. |
| | Olei eucalypti | ♏j. |
| | Tincturæ belladonnæ foliorum | ♏j. |
| | Strychninæ sulphatis | gr. 1/60. |
| | Podophyllotoxini | gr. 1/8. |
| | Aloini | gr. 1/10. |
| | Olei menthæ piperitæ | ♏1/20. |
| | Pepsini | gr. iij. |

M. Ft. capsulæ No. i. Mitte. No. xxx.

## CHROMIDROSIS.

SYNONYM.—Colored sweat.

Chromidrosis is a functional disorder of the sweat-glands, characterized by a coloration of the sweat-secretion.

**Symptoms.**—Chromidrosis is a very rare disorder, and consists in the commingling of sweat with pigment-matter. The sweat is increased in quantity, and may be of a yellowish, greenish, reddish, bluish, brownish, or blackish color. The secretion is not constant in its periods of development. It comes suddenly, to disappear in a brief interval, and again reappear. It may occur upon various parts of the body, but is most frequently observed on the face, chest, abdomen, arms, hands, and feet. It is met with more often in females, especially the unmarried and in those suffering from some uterine derangement, nervous affection, excitement, or shock. The coloring-matter in the secretion is said to be due to Prussian-blue, indican, or other abnormal pigment. Simulated cases of colored sweating have occasionally been reported. A valuable paper upon chromidrosis has been written by Dr. Foot, who ascertained that since the first case was observed in 1709 until the year 1888, forty-six genuine cases had been placed upon record. Six of these had occurred in men and forty in women. He believes that the absorption of indol from the intestinal canal is the source of the indican. Red sweat is usually due to the presence of the bacterium prodigiosum or of blood; but Dr. Stott, of Blackpool, has described two cases of pink chromidrosis occurring in a father and son, from a portion of whole affected skin he succeeded in obtaining a pure culture of a pink torula.

**Treatment.**—The general health should be regulated, and local stimulating applications made. Deception may be guarded against by adopting the following plan: "The spot to be examined is carefully cleansed with oil, and, when perfectly dry, flexible collodion is painted on in a thin layer, and allowed to remain for a few days. When the chromidrosis is actually present, it will show itself after the collodion pellicle is lifted off."

Abnormal changes of the sweat-secretion, different from those referred to, have often been recorded. Thus, urinous sweat (uridrosis) has been noted in which the urinous elements, especially urea, were mingled with the poured-out secretion. The deposit in urinous sweat consists of colorless or whitish crystalline, almost powdery material, which is slightly adherent to the skin; it can be detected by its solubility in alcohol, and by giving with nitric acid the characteristic crystals of nitrate of urea.

The disorder occurs from faulty renal action in uremia; and has also been known to follow the use of pilocarpus.

*Hematidrosis*, or sweating of blood, another example of abnormal secretion, will be noticed on a succeeding page. Greenish sweat, and other peculiar changes in the color, may appear after the ingestion of copper, iodine, tar, turpentine, and phosphorus, and after eating certain species of fish, and also occasionally in the course of phthisis and malaria. The color of the sweat may also become changed from the resorption of excrementitious material in jaundice and yellow fever, in which case the secretion becomes yellow and the skin sallow.

## SUDAMINA.

SYNONYM.—Miliaria crystallina.

Sudamina is a non-inflammatory disease of the sweat-glands, characterized by the development upon the general surface of the skin of whitish or pearl-colored vesicles about the size of millet-seed.

**Symptoms.**—Sudamina appear as discrete vesicles, which may form upon any part of the body, but are more common on the face, neck and trunk. They are about the size of millet-seeds, elevated, transparent or pearl-colored, and look like minute sweat-drops in the skin. The lesions may be limited to a small area or may occupy a considerable extent of surface. They develop rapidly, continue discrete but crowded together, and disappear after the absorption of their contents, with desquamation of their covering. The affection is usually unattended by any subjective symptoms, though in some cases slight burning or itching sensations are experienced. The course of the eruption is variable; fresh lesions may appear frequently and prolong the duration of the disease. Sudamina is distinguished from other vesicular eruptions, especially eczema and varicella, by the entire absence of inflammatory symptoms.

**Pathology.**—The vesicles are formed by the accumulation of the sweat, in some part of the ducts, or between the layers of the epidermis, which collects, owing to the inability of the fluid to escape upon the surface.

**Etiology.**—The cause of sudamina is an elevation of temperature, which frequently follows in the course of many systemic affections, especially the fevers. It is observed in the course of typhus, typhoid, and puerperal fevers, scarlatina, variola, rheumatism, pneumonia, tuberculosis, pyemia, debility, and many other disorders. Exercise, when excessive in corpulent people, the wearing of a large amount of clothing, and free sweating from baths or any cause, particularly in hot weather, may lead to sudamina. Impermeable coverings, such as rubber or oiled silk, may, if too long continued, give rise to sudamina.

**Treatment.**—The treatment should be rationally applied to the disease which occasions the sudamina. Local applications of a saturated solution of boric acid, tincture of witch-hazel, or alcohol, alone or with half a drachm (2 gm.) of camphor to five ounces (160 gm.), however, are most acceptable. Bland dusting-powders, as starch, arrow-root, the impure carbonate of zinc, or the subnitrate of bismuth, may also be employed.

## HYDROCYSTOMA.

Hydrocystoma is a cystic tumor, usually multiple, having its principal seat upon the face, where it appears in the form of discrete, deeply-seated vesicles. These tumors are formed by retention of secretion by the sudoriparous glands.

**Symptoms.**—In this disease, which was first distinctly described by Dr. A. B. Robinson, of New York, in 1893, vesicles appear upon the face, particularly around the nose, upon the temples and upper lip. They seldom or never occur upon other parts of the body. The lesions vary in size from a pin's head to a barleycorn. They may be few in number or several hundred may be present. As a rule, the vesicles are discrete, but in some instances they seem to coalesce. They are spherical in shape and firm to the touch, and have a pearly appearance; similar to boiled sago-grains. They may also be of an ovoid or obtuse contour. The color of the lesions varies. Some are of a light yellow hue, some are of a bluish tint, while others again are white. The lesions are not of inflammatory character. Their contents are clear, watery, and redden litmus paper. The disease occasions no pain, but in some instances there is a feeling of tension and a moderate degree of smarting. Individual lesions continue for a few weeks, when they disappear and others come out to take their place. The eruption is most distinct during free perspiration, and is therefore much more common in summer than in winter. In the absence of perspiration, the vesicles diminish in size or disappear. According to the experience of Robinson, the disease is not extremely infrequent. It generally attacks women of middle age or older, who perform household work in a heated atmosphere, as washerwomen, cooks, etc., although it has been observed in young men.

Examined under the microscope, the corneous layer and rete mucosum are apparently normal. The papillary layer is normal in the early stages of the affection, but after the lesions become large and approach the rete, the circulation is interfered with from pressure. In the upper part of the corium, a perivascular invasion of leucocytes is present in moderate degree. The sebaceous glands and hair-follicles are normal.

These vesicles are caused by a cystic dilatation of the excretory sweat-ducts lying within the corium. The contents consist of fluid intermingled with granular material.

Hydrocystoma differs from sudamina in being more deeply seated and more firm. The lesions of milium contain sebaceous matter. The size, the limited number, and the contents of sebaceous cysts sufficiently distinguish them from the vesicles of cystoma. Pompholyx seldom attacks the face, and is accompanied by heat and itching. As regards treatment, the patient must be instructed to avoid as far as possible everything which tends to increase perspiration, and the lesions must be punctured. Hydrocystoma tuberosum multiplex is identical with lymphangeioma tuberosum multiplex of Kaposi.

## HYDRADENITIS DESTRUENS SUPPURATIVA.

Under this title Dr. S. Pollitzer, of New York, described[1] an example of a rare affection which he had personally observed. The patient was a young man, twenty years of age, and having a good family and personal history. About twenty lesions were situated upon the face and neck. They began in the subcutaneous tissue, the overlying skin being at first totally free from alteration.

**Symptoms.**—The primary form is that of a hard, painless nodule which, in the course of ten to fourteen days, attains the size of a pea. The epiderm becomes raised, producing the appearance of a small, round tumor. As the growth enlarges the skin covering it becomes reddened, and a drop of pus issues if the nodule be pierced or broken. A few days later, retrograde changes commence, the tumor becomes yellowish, the epiderm gives way, and a few drops of blood-stained pus escape, small shreds of tissue are sometimes extruded. If the secretion accumulate, it forms a discolored crust which falls off in a few days, leaving a dark, reddened skin which remains pigmented for many weeks, a slightly depressed scar ultimately occupying the situation of the tumor. About four weeks are consumed in this process. Occasionally neighboring nodules coalesce and form a flat tumor as large as an almond, which, in breaking down, discharges through a number of small openings. Some of the lesions may remain quiescent for months without enlargement or suppuration.

The tubercles appeared upon parts marked by a dense growth of hair.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, January, 1892.

The hairs, however, were not loosened, and even grew normally from the shallow cicatrices, showing that their follicles were not injured. The growths developed in crops at irregular intervals of a few days to several weeks. This process continued for about nine months. Adjacent lymphatic glands were not swollen. The temperature was unaffected and the urine was free from albumin or sugar.

**Diagnosis.**—The subcutaneous origin of the nodules distinguished them from acne; no bromides had been administered; they lacked the severe inflammatory manifestations of furuncles and the discharge of a central necrosed mass; the non-involvement of the hairs, and the absence of its fungus excluded trichophytosis, while the course of the malady bore no resemblance to that of a syphilitic deposit.

**Pathology.**—Two nodules were excised and examined. One of these was taken from the subcutaneous tissue, while the other illustrated a later stage of development, just prior to rupture of the cuticle. The appearances were essentially the same in both, the tumors consisting of a dense aggregation of small, round cells, epithelioid cells, and large multinuclear masses resembling giant-cells. The small cells were of inflammatory origin. Individual epithelioid cells were seen containing from two to five nuclei, and forms could be traced which merged by indistinguishable gradations into the giant-cells. These were very numerous, and, as a rule, were somewhat smaller than those of tuberculosis or other granulomata. The nuclei varied in number from five to twenty. Most of the cells were of an irregularly round or oval shape, but some were very irregular in form. Blood-vessels could be traced throughout the entire growth. The endothelium was generally swollen, the capillaries occupying the centre of the nodule being completely occluded. The hair-follicles were numerous and large in and around the tumor, and appeared entirely normal. The sebaceous glands also seemed to be unaffected. No sudoriparous glands were included within the new growth, but were observed in its vicinity. Many of these glands showed peculiar changes. Their epithelium was swollen, and in many instances the tubules were obliterated. In some no further changes had taken place, in others some infiltration had occurred within the coil, and the swollen epithelium completely filled the tube with a homogeneous mass. In such glands the membrana propria could not be distinguished. The author regards the giant-cells as formed of degenerated and broken-up fragments of the epithelium of the sweat-glands. The epithelioid cells are probably formed in the same way by a breaking up of the degenerated gland epithelium into fragments smaller than those which resemble giant-cells. This mode of formation, the author goes on to say, of giant-cells in the skin has not before been described; but is analogous to that observed by Waldstein in tuberculosis of the testicle and by Taylor and Van Giesen in diffuse orchitis. The sweat-glands are the starting-point of the process. They are the seat of a parenchymatous degeneration which, in all probability, originates primarily within the glands. The disease would appear to be of infectious origin, but cultures of fresh pus were entirely negative, no organisms whatever being detected. The writer was unable to make any inoculation experiments.

Dr. Pollitzer regarded the case, which he so carefully studied, as being identical with those described by Velpeau, Verneuil, and a few other French writers, and, more lately, by Barthélémy under the name of acnitis. Darier found round, epithelioid, and giant-cells in sections made from Barthélémy's cases. Lukasiewicz has published a paper from Kaposi's clinic describing an affection which strikingly resembles that observed by Pollitzer. Dubreuilh has written of the same affection under the name of hydrosadenitis disseminata suppurativa.

**Etiology.**—This disease, according to Verneuil, may result from either local or general causes. Among the former are uncleanliness, cold, rough friction, irritating applications, parasites, etc. Constitutional causes given are "herpetism," dyspepsia, constipation, pruritus, scrofula, fevers, etc.

**Treatment.**—Pollitzer, in his case, prohibited shaving, covered each nodule with Unna's mercurial, carbolic-acid plaster, incised the nodules when they had softened, and washed the affected region frequently with a three-per-cent. salicylic-acid, alcoholic lotion. Toward the termination of the case, he administered corrosive sublimate with iodide of potassium. Equal parts of zinc oleate and French chalk together with three per cent. of salicylic acid compose a good dusting-powder.

## CLASS II.

## HYPEREMIAS.

*(Hyperemiæ.)*

THE class of Hyperemias includes those disorders which are characterized mainly by the presence of an increased quantity of blood in the cutaneous vessels. The increase may be universal and affect the entire surface, but it is usually limited to certain regions of the body. It may be active or passive in character, and idiopathic in origin, or symptomatic of disturbances in remote portions of the system.

The increased blood-supply is always productive of changes in the color of the affected portion of the skin. The color of hyperemic eruptions varies from light-red to dark-red or purple, but disappears upon pressure, to return as soon as the pressure is removed. Active hyperemic eruptions may be accompanied by slight burning or itching sensations, and usually pursue an acute course.

Passive hyperemia is usually indicative of either mechanical or functional interference with the circulation. In the former case tight garters, bandages, or clothing may be the cause, and the affection disappears when they are removed; in the latter case, cardiac or valvular disease or varicosity of the veins may be the producing cause, when the hyperemia is apt to remain for an indefinite period, and finally result in permanent pigmentation of the surface.

## ERYTHEMA SIMPLEX.

Erythema simplex is a hyperemic cutaneous affection characterized by the formation of reddish, non-elevated macules, or patches, on the general surface of the body.

**Symptoms.**—There are two varieties of erythema simplex, (1) the idiopathic and (2) the symptomatic. 1. The idiopathic variety is generally subdivided into the three groups of erythema traumaticum, erythema caloricum, and erythema venenatum. The symptoms differ somewhat according to the form of the affection which may be present. In erythema traumaticum, the skin is reddened and tender at the point which has been subjected to pressure or friction, but normal elsewhere. In erythema caloricum, the skin is reddened, and more or less painful, but only at the point which has been exposed to intense solar, or artificial, heat. This may also be produced by the actinic rays of light, as in the mild forms of so-called Röntgen ray dermatitis and radium burns. In erythema venenatum the eruption is more diffused, but it is painful, and limited to the regions with which the irritating or poisonous material has been placed in contact. In erythema symptomatica there is no pain or itching, and the eruption may appear upon any part of the surface. In some cases the lymphatics are involved, in others the face, or perhaps the limbs, and occasionally the whole surface is invaded. 2. The lesions of erythema symptomatica are exceedingly numerous, and of all shapes and sizes, but they are ephemeral in character, frequently disappearing in a few hours, and rarely remaining longer than two or three days. In erythema traumaticum, venenatum, and caloricum the lesions are but few in number and more persistent. Erythema symptomatica is mostly preceded or accompanied by gastric or intestinal derangements.

**Diagnosis.**—The diagnosis of erythema simplex is usually easy. The only affections with which it could be confounded are rötheln, macular syphilis, and simple dermatitis. Rötheln, however, is accompanied by fever and catarrhal symptoms, phenomena which do not occur in erythema simplex. In macular syphilis the lesions are equal in size, circular in shape, and arranged rather symmetrically in groups. In erythema symptomatica the lesions are of all shapes and sizes, and irregularly distributed. There is no specific history, and evidences of gastro-intestinal irritation are present. In dermatitis there is no severe pain, but there is more or less increase of temperature.

**Pathology.**—The redness of the epidermis arises from congestion, and is due to dilatation of the capillaries of the superficial layer of the corium.

**Etiology.**—The causes of erythema simplex are numerous and varied. The idiopathic varieties are produced by the action of heat or cold, or by friction or pressure in any form, or by contact with acids, strong alkalies, aniline dyes, mustard, sulphur, arnica, cantharides, arsenic, antimony, poisonous plants, and other irritating substances. Symptomatic erythema results from the ingestion of improper food, or from worms, or from constipation, or other disorders of the gastro-intestinal tract. It may be due to pelvic disease, or pus tubes. It may also arise from the irritation of dentition, or any disturbance of the nervous system.

M. Perrin believes that erythema occurs in a certain number of cases of gonorrhea, independently of treatment by copaiba or cubebs, and that the action of those substances in producing a rash is at least assisted by a tendency of the disease.[1]

**Treatment.**—The treatment varies with the cause and extent of the disease. Erythema symptomatica rarely requires any treatment beyond the administration of a gentle laxative. If worms exist, they should be removed by the employment of appropriate anthelmintic remedies. Constipation should be corrected, and pelvic disease removed. In idiopathic erythema, no internal medication is requisite. In many cases, the local irritation is removed by the application of cold water alone. In others, soothing ointments, or lotions, will usually bring immediate relief. Patches of chronic erythema may be treated by the application of adrenalin solution, followed by flexible collodion. The rubber adhesive plaster made with oxide of zinc (Z O adhesive plaster) is a good application to hyperemic patches.

**Prognosis.**—The eruption is always trivial in character and usually speedily disappears.

## ERYTHEMA INTERTRIGO.

Erythema intertrigo is a hyperemic cutaneous affection produced by heat and the contact of opposing surfaces. It is characterized by a reddened condition of the skin, and accompanied by a sensation of heat or burning.

**Symptoms.**—Erythema intertrigo is that form of erythema which occurs in the natural folds of the skin, and wherever two opposing surfaces come in contact with each other; *e.g.*, as between the nates, beneath the mammæ, and in the axillary and inguinal regions. It is observed most frequently during the summer months, but may appear during any season of the year. It occurs especially in fleshy persons and in infants. The skin in the affected regions becomes reddened and chafed, and is more or less hot and painful to the touch. If the exciting cause be removed, or if remedial measures be instituted, the affection may be arrested in this stage. In many cases, however, it passes into a mild form of dermatitis. Occasionally it terminates in eczema.

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[1] Annals de Derm. et de Syph., November, 1890.

The duration of erythema intertrigo varies from a day or two to several weeks. In some it remains throughout the heated term, and is a source of much annoyance and suffering. When it occurs in infants it is more or less obstinate to treatment, especially if the eruption is situated between the nates. The perspiration which usually accompanies the eruption may sometimes be so excessive and acrid as to produce extensive maceration and desquamation of the epidermis.

**Diagnosis.**—The diagnosis of erythema intertrigo is usually self-evident. The location and character of the eruption are sufficient to distinguish it from the lesions of any other disease. The erythematous patches of infantile syphilis occasionally simulate those of the innocent affection, but the existence or speedy appearance of other syphilitic lesions unerringly indicates the true nature of the disease. From ring-worm it is diagnosticated by microscopic examination of scrapings from the surface.

**Pathology.**—The only pathological change that occurs in the great majority of cases of the eruption is dilatation of the blood-vessels of the corium. Excessive perspiration may produce maceration and separation of the epidermis, or of its superficial layers.

**Etiology.**—The exciting causes of erythema intertrigo are heat, and the friction or pressure of two opposing cutaneous surfaces. The predisposing causes are numerous, and include all circumstances which increase the temperature of the body or of the affected region, or which produce an irritable or sensitive condition of the skin. Among direct or indirect causes may be mentioned summer weather, unusual exercise, heavy underclothing, tight or ill-fitting garments, sedentary habits, and constipation. In infants the irritation produced by worms and by acrid discharges from the bowels leads frequently to the disease. The presence of bacteria of various kinds may be recognized, which find a suitable culture medium in the warmth and moisture, but are accidental, and not etiological in their character, or at least not directly so in this disease.

**Treatment.**—No internal treatment is required, as a rule, except when constipation exists. In some cases, however, occurring in very fat persons, the best treatment consists in the daily administration, for two or three weeks, of full doses of any of the saline purgatives, in order to produce copious intestinal discharges. This may be preceded by a blue pill in adults; or calomel and soda for infants. The local treatment is of the simplest possible character, and consists chiefly of cleanliness and rest. The affected surfaces should be bathed with cold water two or three times a day, and gently mopped dry with a soft cloth. Soap and friction are injurious, and should not be used. If practicable, the erythematous surfaces should be kept separate by the interposition of a piece of linen or soft muslin. Where this can not be done, they should be dusted over with any astringent non-irritating powder, as in the following formulæ:

| | | | | |
|---|---|---|---|---|
| ℞ | Bismuthi subnitratis, | | | |
| | Plumbi carb. | āā ℥ss, | 16. | M. |
| ℞ | Pulv. marantæ | ʒij. | 8. | |
| | Zinci oxidi | ʒvj. | 24. | M. |

In many cases, more benefit will be derived from the application of a bland ointment:

| | | | |
|---|---|---|---|
| ℞ | Bismuthi subnitratis | ʒiij. | 12. |
| | Plumbi carb. | ʒij. | 8. |
| | Ungt. zinci oxidi | ℥jss. | 48. |

M. Ft. ungt.

Lotions of lead-water and laudanum, of alum, borax, or sulphate of zinc, will be found serviceable in some cases.

**Prognosis.**—The eruption speedily disappears under treatment, or without treatment when the exciting, or predisposing, cause is removed.

## ERYTHEMA SCARLATINOIDES.

SYNONYMS.—Scarlatiniform erythema—Scarlet rash—Skin shedding rash—Deciduous skin.

Certain erythematous eruptions are followed by desquamation. They may be attended by acute symptoms, fever or slight premonitory constitutional and local disturbances, or they may be subacute in type, and appear without any attendant phenomena. It may begin anywhere on the surface, although the head and neck are generally spared, and spread rapidly over the entire body. The skin becomes red universally, and the mucous membranes of the mouth and throat may be reddened and smooth. In three or four days, desquamation begins and the skin comes off in large sheets. Exceptionally, the nails and hair are shed. In subacute cases the course may be much slower and the disease last for months, and may develop into exfoliative dermatitis.

**Etiology.**—Scarlet rash is a manifestation of some form of toxinemia. Various infectious diseases, especially septic in character, may cause it. Diphtheria antitoxin injections may give rise to it, also sewer gas poisoning. Certain articles of food and drugs have been known to cause it. Probably an idiosyncrasy is present as a predisposing cause in most cases.

**Diagnosis.**—It is difficult in some instances to distinguish this clinically from light attacks of scarlatina; from the typical cases it is differentiated by the mildness of the attendant symptoms, especially in the throat.

**Prognosis.**—Good, but the disease may return. It may develop into the graver condition known as exfoliative dermatitis.

**Treatment** is chiefly hygienic. The remedies named above are also useful in this form of erythema.

## ERYTHREMIA.

SYNONYMS.—Polycythemia with cyanosis—Maladie de Vaquez.

Erythremia was first described in 1892, by Vaquez, a Paris physician, well-known for his researches on the pathology of the blood. It is essentially a condition of hyperglobulism with cyanosis, due to over-activity of the blood-making organs. Cases have been described by Cabot, of Boston, McKeen, Saundby and Russell, and especially by Osler. . The latter was able to summarize, including his own three cases, seventeen in a paper which was published in the British Medical Journal (Jan. 16, 1904). There are now at least seventy cases on record, according to this writer.[1]

**Symptoms.**—A condition of apparently robust health is attended by pains in the hands and feet, resembling neuritis. General strength becomes impaired. The most noteworthy phenomenon is a blue color of the skin of the face, and the hands and feet. This is more marked in the cold, and is due to cyanosis. There may be some distended venules observed on the nose. The tongue and lips are purplish red. When the hands are allowed to hang down they become intensely cyanosed, when they are held up the congestion disappears and they become pale. This is even more evident in the feet. The general surface is of a dusky hue due to passive hyperemia.

Pressure with the hand produces local anemia, which lasts a second or two, and is slowly obliterated. A hard pointed pencil drawn over the skin, is followed by a temporary linear vaso-constriction, causing a band of anemia on each side of the line. Attacks of asthma and of bronchitis are common and hemoptysis may occur. Cerebral apoplexy may cause sudden death. Headache is a common symptom with occasional vertigo. Constipation frequently is observed.

**Pathology.**—Enlargement of the spleen with polycythemia (9,000,000 to 13,000,000 per cubic millimeter), and general cyanosis are the three principal features of erythremia. There is little change in the shape of the red-blood cells, but nucleated red-blood cells, of all forms, are found. The specific gravity of the blood is about normal. The plasma is relatively greatly decreased. Slight albuminuria may be observed. High blood-pressure is the rule. Arteriosclerosis may also be present.

**Diagnosis.**—The congestion and pains in the hands may suggest *erythromelalgia*, the red painful neuralgia of Weir Mitchell, or the local congestion of *frost-bite*; but both of these are strictly local affections and are not attended by polycythemia or enlargement of the spleen. *Ray-*

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[1] The Lancet, Jan. 18, 1908.

*nand's disease* is also strictly limited to certain portions of the body, such as the fingers or ear-tips. In the condition known as ochronosis, there is a bluish condition of the auricles and discoloration of the face, but there is no increase in the proportion of blood-cells. In erythremia, the patient has an excess of 50 to 100 per cent. in the proportion of red-blood cells, which occurs in no other disease, and excludes *Bright's disease*, which presents high blood-pressure, albuminuria and arteriosclerosis but not cyanosis. Ambard and Fiessinger have reported a case of congenital cyanosis with polycythemia, in which there was intense proliferation of the bone-marrow.

As pointed out by Osler, a true erythremia follows a residence at high altitudes. It is also present in congenital heart cases. In these conditions the polycythemia is adaptive, more corpuscles being required to carry on the process of $O_2$ metabolism. In the form under consideration, attended by splenomegaly, there occurs (Osler ) "a plethora vera; intense hyperplasia of bone marrow, a myelomatosis rubra and enlargement of the spleen, with histological changes indicative of chronic passive congestion, and a uniform hyperplasia of all its elements." There is an excessive supply of red-blood cells without any corresponding demand: just as there is an increase of white cells in leukemia. It has been suggested by Koranyi and Bence that the disease is due to a lessened power of the red-blood cells to absorb oxygen. The increased viscosity of the blood is apparently an important element in producing the cyanosis. Saundby also has suggested that there is a slowing of the distal circulation due to capillary dilatation. A true and sufficient explanation of this disease has not yet been supplied.

**Treatment.**—The local evidences of congestion of the brain, or of the lungs, can be relieved temporarily by venesection. Inhalations of oxygen have been employed with diminution of the cyanosis and of the blood corpuscles also. It has been suggested by Osler to treat the enlarged spleen by x-radiation. A diet deficient in proteids, and meagre in quantity, together with the free use of distilled water, or lithia water, would naturally be followed. The possibility of a malarial origin for the enlarged spleen should be considered.

**Prognosis.**—The prognosis is not favorable on account of the tendency to high blood tension and arteriosclerosis. Several cases have terminated fatally by cerebral hemorrhage. Oedema may be produced by local congestion, or may be symptomatic of renal changes and especially of chronic interstitial nephritis. Systematic treatment in a hospital under very favorable circumstances may lead to recovery, which may continue if the former mode of living be not resumed.

## CLASS III.

## HEMORRHAGES.

*(Hemorrhagiæ.)*

CUTANEOUS hemorrhages may occur from a rupture of the blood-vessels, as from external injury, more rarely they are due to spontaneous rupture of capillaries. Sometimes the blood-corpuscles may escape through the capillary walls by diapedesis and pass into the skin.

The lesions formed from hemorrhages into the skin may assume certain appearances, which are known by the following names:

*Petechiæ* consists of small round or irregular spots, varying in size from a pin's point to a finger-nail.

*Vibices* are long, narrow, streak-like spots.

*Ecchymoses* are irregular patches, from the size of a coin to that of the palm of the hand, or larger.

*Ecchymomata* appear as variously sized and shaped patches or tumors, which may be flat or elevated.

Hemorrhages into the skin which result from external injury are known as traumatic, primary or idiopathic, and those which occur from internal disease are termed symptomatic. They also may occur spontaneously.

**Idiopathic Hemorrhage.**—Here the hemorrhage is usually the result of traumatism. Wounds, contusions, and all forms of injury may cause a rupture of the blood-vessels, and an extravasation of more or less blood into the skin and even the underlying tissue. The bites of numerous insects, particularly of the louse, bed-bug, and flea are also causes of idiopathic hemorrhages. The treatment consists in the application of remedies to hasten absorption. Occasionally stimulating ointments and lotions are of advantage. Mercurial ointments, especially the oleate, have proved of service. Localized hemorrhagic spots which are on the face or exposed parts can be relieved and absorption hastened by leeching or puncturing, and painting them with a thick paste of carbonate of lead.

**Symptomatic Hemorrhage.**—To this form belong all hemorrhages which arise from systemic disturbance. The toxic action of certain drugs produces hemorrhagic lesions of the skin, as in poisoning by potassium chlorate.[1] They occur in connection with small-pox, typhus and cerebro-spinal fevers, and other diseases, and also at times in the course of urticaria, erythema nodosum, and pemphigus. There are several forms which are recognized as independent diseases, and call for separate description.

**Spontaneous Hemorrhage.**—Small hemorrhages may occur without known cause. For instance, Etienne, of Nancy, reported a case[2] of ecchymotic eruption, occupying exactly the region of the frontal nerve, appearing spontaneously after a period of severe neuralgic pain. This morbid type closely approaches herpes zoster and may be attributed to a phenomenon of extreme vaso-dilatation, owing to lesions of the fibres of the sympathetic.

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[1] Case reported by Dr. Lester W. Day of Minneapolis, Jour. Amer. Med. Assoc., July 22, 1905.

[2] La Tribune Medicale, Aug. 24, 1907.

There is a form of subcutaneous bloody effusion which affects the auricle. It is known as **Othematoma.** This is defined as a swelling, not inflammatory nor painful, affecting the pinna of the ear, which is especially observed among the insane.

**Symptoms.**—There is a separation of the skin from the underlying fascia; this is followed by effusion, which is more or less bloody. Reformation of fluid occurs after evacuation. In small collections, gradual resorption usually takes place. Large ones may persist for years. The liquid is non-coagulating and consists of serum, leucocytes and red-corpuscles. Kohler suggests that it is due to local escape of lymph from injured capillaries. The sac is not quite full and fluctuates. The collection may be superficial or deep. It has the same pathology as hematoma of septum of nose and larynx.

O. Voss,[1] of Konigsberg, states that the constituents of the cyst are lymph and a little blood. The fluid is not coagulated spontaneously if exposed to the air. In a test tube the fluid divides into 3 layers: (1) superior is formed of fatty corpuscles; (2) median is made up of blood serum; (3) lowest is composed of deformed red blood-cells. It is lymph more or less mixed with blood which does not entirely fill the cysts. The small cysts may not refill after evacuation, but the larger ones do. The exciting cause is traumatism, not by a direct but a glancing blow, or from rough friction. Voss found that, in the rabbit, he was not able to produce a hematoma by the blow of a hammer on the ear; but vigorous rubbing of the auricle caused a hematoma.

**Etiology.**—Traumatism has been assigned as a cause (football, boxing, athletics). Freezing followed by rough friction of the part, may cause it.

**Treatment.**—The application of lanolin cream or similar soothing ointment is all that is required in recent cases. In older ones a stimulating ointment containing iodine may be applied. Large collections may be aspirated with a hypodermic needle.

## PURPURA.

Synonyms.—Hemorrhea petechialis—Blutfleckenkrankheit.

Purpura consists in the formation of hemorrhagic patches on the skin of different sizes and shapes, slightly elevated or non-elevated, and not disappearing on pressure.

**Symptoms.**—Purpura may occur in three varieties, and, as they differ very much in their symptoms, it has been considered better to describe them separately, as follows:

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[1] Archiv für Ohrenheilkunde, Blxvii, H 2 and 3.

PURPURA SIMPLEX.—Purpura simplex is seldom ushered in with constitutional disturbance. Rarely, it is preceded by lassitude, loss of appetite, and slight fever. The eruption may appear suddenly, usually overnight, or gradually in the course of several days. The hemorrhagic spots are bright, or deep, red or purplish in color, and are variously shaped, and in size from a pin's point to that of a pea. They are not elevated, but are situated deep in the skin, and will not disappear on pressure. They occur mostly in numbers, irregularly over the surface, but have a predilection for the lower extremities, especially the thighs. Subjective symptoms, excepting a general soreness of the skin, are absent. Occasionally they may be accompanied by moderate itching, but seldom by pain. Wheals, however, at times develop as a complication, the itching being marked, and the condition is then known as purpura urticans. Blebs have also been observed in this variety of purpura. The disease usually runs its course in one or two weeks; but it may be prolonged for months by the formation of successive crops of the eruption. It occurs generally in the debilitated, and especially in old persons.

Dr. E. Morin has given the particulars of a case in which, during ten years, an eruption of purpura simplex made its appearance two or three days before each menstrual period, reached its height in twenty-four hours, and disappeared at the end of eight or ten days. The patient was otherwise healthy and had never been subject to hemorrhage prior to the development of the purpura.[1] Purpura simplex has been known to result from the use of certain drugs, as quinine, chloral, salicylic acid, and iodide of potassium.

PURPURA RHEUMATICA, OR PELIOSIS RHEUMATICA.—Purpura rheumatica is, as a rule, preceded or accompanied by lassitude, despondency, impairment of appetite, constipation, fever, and rheumatic pains, especially about the joints. Swelling of one or more joints sometimes occurs. After a time, mostly in several days or a week, an eruption suddenly appears over the body, being more profuse on the abdomen and limbs. The hemorrhagic spots, which are usually well defined, are somewhat raised or on a level with the skin, and the only subjective symptom which accompanies them is soreness of the skin. In color the spots are light-red or purplish, and in size they are generally about that of a finger-nail, but may attain the size of half a dollar. They will not disappear on pressure; but in time, as the blood is gradually absorbed, they change into yellowish and greenish tints, until finally they fade away entirely. In rare instances a hemorrhagic spot becomes gangrenous. The rheumatic pains sometimes abate, or disappear with the appearance of the eruption. In many cases, however, the constitutional symptoms continue throughout the disease, or appear in the form of relapses together with successive crops of the eruption. The course and duration of the disease are uncertain, continuing weeks or months, or prolonged for a greater period. Hemorrhage from the internal organs, especially the kidneys, may happen as a complication, and occasionally may prove fatal. Certain cases are accompanied by gastro-intestinal disturbances, such as colic, vomiting and diarrhœa. Occasionally there may be hemorrhage from the stomach or bowels, which may be so violent as to induce local necrosis, perforation, and peritonitis.

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[1] See Medical Bulletin, May, 1891.

The disease is rare, and bears some relation to erythema multiforme, with which it has been associated at times. It occurs in both sexes about middle life, and is seen more frequently in women. It is sometimes met with in children and young adults. The cause is obscure, but it usually occurs in persons with a rheumatic history or heredity. I have seen several cases in which it was due to great nervous exhaustion, and in one instance to excessive venery. No relation can be traced between this form of purpura and cardiac disease. It never seems to give rise to endocarditis or pericarditis. Kinnicut, indeed, has detected endocardial murmurs, but these were probably due either to anemia or to a pre-existent valvular lesion.

A very remarkable case of purpura rheumatica, complicated with suppurating irido-choroiditis of both eyes, has been published by Dr. J. H. Thompson, of Kansas City, Mo.[1] A girl, eight years of age, of previous good health, born of healthy parents, was suddenly attacked with chill, high fever, followed by coma. At the end of about thirty hours, the fever having moderated and consciousness being restored, the light was found to be painful to the eyes. Twelve hours later, she was totally blind in both eyes, the anterior chamber was half filled with pus, a purulent deposit and gelatinous layer of inflammatory exudation covering the irides. At the same time a slight purpuric eruption was discovered upon the arms and legs, together with some swelling of the wrist-joints and fingers. The inner surface of the lips and anterior half of the tongue were covered by a herpetic eruption, which was so confluent that it made one continuous mass covering the mucous surface and the skin from the nose around the mouth to the chin. At the time it was yellowish-white, but in twenty-four hours turned black because of the extravasated blood. The general condition of the patient indicated profound depression, but constitutional improvement was rapid, and in a week from the day of attack the child was well. The blindness, however, permanently remained.

Dr. André Moussous reported two cases of purpura rheumatica associated with severe nephritis. In one, that of a child thirteen years years of age, a fatal result took place, and there was found chronic endocarditis, probably due to an antecedent attack of rheumatism. Microscopic examination revealed general diffuse nephritis,[1] which is not an unusual complication of acute rheumatism.

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[1] Kansas City Medical Record, November, 1889.

PURPURA HEMORRHAGICA—MORBUS MACULOSUS WERLHOFII, OR LAND-SCURVY.—Purpura hemorrhagica is a severe form of the disease. It is generally preceded or accompanied by pronounced constitutional symptoms, as lassitude, languor, debility, headache, loss of appetite, and fever. Suddenly hemorrhagic spots appear, usually first on the limbs and afterward upon other parts of the body. They also occur on the hard palate and inside of the cheeks, and other parts of the mouth. The spots appear mostly in numbers, and of all sizes and shapes. In rare instances an extravasation takes place between the derm and epiderm, giving rise to a blood-filled vesicle. At the same time, or shortly after the appearance of the eruption, hemorrhages may take place from the mucous membranes, especially the mouth, gums, nose, fauces, bowels and kidneys. Metrorrhagia, hemoptysis, and effusions beneath the conjunctiva into the retina, choroid or sclerotic, have likewise been observed. Epileptiform attacks and paralysis may result from meningeal or cerebral hemorrhage.

The disease is uncertain in its course and duration. It may terminate favorably, suddenly or gradually, in a short time, generally in from one to four weeks, or lasting, with relapses for quite a period. It is a dangerous disease, and will sometimes incline to a fatal termination. Death may occur from anemia, heart-failure with edema of the lungs, or from cerebral hemorrhage. It occurs in the badly nourished, the debilitated, especially from nervous exhaustion, and also in those apparently of robust health. The duration of purpura hemorrhagica is indefinite, but its average course may be stated as from two to ten weeks. Relapses are not infrequent.

Diabetes mellitus has once been seen as a sequela, perhaps in consequence of hemorrhage into the diabetic area of the medulla oblongata. In six cases, Fagge observed it to be followed by sarcoma of various organs. Repeated losses of blood produce decided anemia. The number of red blood-corpuscles may be diminished and that of the white increased. Marked pallor, exhaustion, shortness of breath, vertigo, palpitation of the heart, syncope, and edema may result from the impoverished state of the blood.

An interesting case in which the disease ran an acute course has been described by Zanetti. A woman, aged twenty-three years, after suffering for some time with lumbar pains and headaches, suddenly grew worse with intense sacral pain, prostration, fever, hematemesis, hematuria, metrorrhagia and abundant hemorrhagic spots upon the skin. Death took place from syncope on the third day. Hemorrhages were found into the bowel, peritoneal cavity, and ventricles, the spleen was slightly enlarged, and the liver in the early stage of fatty degeneration.

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[1] British Medical Journal, February 7, 1891.

Under the title of purpura fulminans, or purpura foudroyante, a number of cases occurring in children have been described. This form is characterized by sudden onset, pain in the limbs which were swollen, edematous, and cyanotic. There was no hemorrhage from mucous membranes, and death resulted in from twenty-four hours to two or three days. Some of these cases had been preceded by illness of another nature, as pneumonia or scarlet fever. A similar instance has been added by Dr. Henry Jackson, of Boston. A boy, five years old, about three weeks after a mild attack of measles from which he had entirely recovered, while apparently in good health, became slightly indisposed for two days, after which a few purpuric spots were seen upon the skin. During the next four days, hemorrhages occurred from the bowels, bladder, stomach, and nose. The spots upon the skin increased in number and size, and death occurred upon the fourth day. The severe hemorrhages by which it was accompanied distinguished Dr. Jackson's case from those of Henoch, to which, however, it seems allied by the rapidity and fatality of its course. In a personal communication to the author, Dr. M. O. B. Ward, of Montreal, describes a similar case in a girl, eight years of age, convalescing from scarlatina, death occurring on the fourth day. Henoch has also described a variety marked by gastro-intestinal disturbances and severe colicky pain in addition to the hemorrhagic lesions; in some there were pain and swelling in and around the joints, with edema of the hands or feet. Dr. W. A. Phillips, of Evanston, Ill., reported a case in which purpura complicated gonorrheal rheumatism. There was no previous history of rheumatism. Though most of the lesions were purely hemorrhagic, yet some bore a resemblance to those of erythema nodosum. Dr. Frank Woodbury has reported a case of an adult woman who had an idiosyncrasy against quinine, in whom a small dose of two to four grains, would, in a few hours, bring out an eruption of purpura on skin and mucous membranes, accompanied by free hemorrhages.

Scorbutus, true scurvy, or sea-scurvy, may in this connection be briefly mentioned. The constitutional symptoms are more marked in scurvy, as a rule, but the purpura which it occasions is more apt to involve the deeper structures—the muscles, fascia, and subcutaneous cellular tissue. The internal organs may show some complication; but there is less liability to hemorrhage from the mucous membranes than in purpura hemorrhagica. The gums in scurvy are, however, more decidedly affected; they are spongy, softened, and painful, and become the seat of ecchymomata and ulcerations, the ankle or knee joints are often tender to pressure, and more or less edematous. The disease arises from poor hygiene and food, particularly an insufficiency of fresh vegetables and fresh meat, especially on vessels and in institutions. It has also been produced by the use of sterilized milk as the sole food for children. It appears slowly, and is chronic in its course, but inclines to disappear with the removal of th exciting cause and the use of proper food and appropriate remedies. Dr. Calcott Fox has described the results of an autopsy which he had made upon the body of a boy who died of scurvy. There was extreme atrophy of the fibulæ, tibiæ, femora, and to a less extent of the bones of the upper extremity; wasting of the muscles; circumscribed scanty hemorrhages between the periosteum of those bones as well as others; ecchymoses beneath the pleura; separation of the lower epiphyses of the tibiæ, and loosening of the upper ones of the femora.[1]

Scurvy sometimes occurs among infants as a result of deficient nutrition, especially when fed upon sterilized milk, as pointed out by Dr. J. Crozier Griffith, of Philadelphia.

**Pathology.**—In purpura, the extravasation of blood, as a rule, takes place suddenly, and passes into the different layers of the skin. It is usually found accumulated in the corium or in the subcutaneous cellular tissue. It occasions spots of various sizes and shapes, according to the quantity effused and the permeability of the tissues. The blood, after leaving the vessels, becomes a foreign body. Absorption occurs very slowly, the fluid portion being first removed. The corpuscles and coloring-matter which remain occasion various changes in hue—blue, purple, dark or bright red to green or yellow—as absorption gradually takes place, and the skin returns to its natural condition. No definite or constant change has been discovered in the constitution of the blood, though it is probable that such alteration exists. Nor is the condition dependent upon any recognized lesion of vascular walls. Rigal and Cornil attribute the hemorrhage to disturbance of the vasomotor centre. The viscera are found very pale after death, and not infrequently contain extravasations. The spleen is often enlarged, and hemorrhages have been found in the medullary cavities of the bones.

**Etiology.**—Micro-organisms have been detected in the blood in purpura by several observers, especially the micrococcus associated with rheumatic arthritis. Blood from patients suffering from purpura, injected by Petrone into the veins of rabbits, produced a general hemorrhagic condition. Letzerich has isolated a bacillus which has sharp angles and edges, which he cultivated in gelatine, and the pure cultures of which injected into rabbits occasioned hemorrhages, either spontaneously or upon slight trauma. Steinheil, of Paris, has found a micrococcus in the blood, and has succeeded in making cultivations. He ascribes the hemorrhage to occlusion of small vessels by colonies of micrococci, together with consecutive inflammatory softening. Martin de Guimard (Thèse de Paris, 1888), who studied twelve cases of purpura in children under the care of Professor Grancher, found a micrococcus in the blood during life and in the hemorrhagic spots after death. Cultures of these organisms when injected into a guinea-pig caused hemorrhages in various parts of the body. An accumulation of the cocci occupied the centre of the extravasation. Watson Cheyne found bacilli in one and micrococci in another case of purpura.

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[1] Lancet, May 24, 1890.

Hanot and Luzet have reported[1] a case in which purpura was transmitted from mother to fetus. The woman died, and, though no purpuric spots were found upon the skin of the child, the serous cavities contained a reddish fluid, and disseminated extravasations were found in the lung and thymus gland. A micrococcus was recognized in the viscera and blood both of mother and child.

Purpura sometimes supervenes after nervous shock. Cutaneous hemorrhage has been observed to follow the injection of diphtheria antitoxin. Purpura hemorrhagica of a severe type may occur during menstruation and pregnancy, not infrequently having a fatal termination. Occurring during pregnancy, it leads to abortion or premature delivery. Purpura occasionally develops during or subsequent to typhoid fever and other severe infectious diseases, notably acute rheumatism. It has appeared shortly after an attack of tonsillitis.

**Treatment.**—The treatment will depend upon the cause. Cases of purpura having a rheumatic history and symptoms, form a distinct group, which are benefited by salicin, sodium salicylate, alkalies and anti-rheumatic remedies generally. Attention to diet and hygiene is essential. Rest is of advantage, and if the hemorrhage be extensive it is absolutely necessary that the patient be kept recumbent. In purpura simplex the preparations of iron, especially the tincture in full doses, from three to six times a day, are valuable. The elixir of gentian with tincture of the chloride of iron (N. F.) is a useful combination. Equal parts of tincture of iron and fluid extract of ergot often act most decidedly. Quinine, belladonna, and mineral acids are also to be commended. A prescription that has often been serviceable is ten drops of dilute phosphoric acid with one-eightieth of a grain (0.0008 gm.) of sulphate of strychnine, three times daily. The chlorate of potassium is sometimes useful in from five- to twenty-grain doses (0.30 to 1.30 gm.), but its effects should be carefully observed upon the blood-cells and the kidneys. The fluid extract of witch-hazel in from ten- to thirty-drop doses, *ter in die,* has also been productive of benefit. Friction with cologne spirits, tincture of witch-hazel, salt and water, vinegar and water, solutions of alum or tannic acid, cold water or ice is most suitable and advantageous.

PURPURA RHEUMATICA demands most careful attention to hygiene, and often requires rest in bed or a complete change of air, and occasionally of occupation. The diet must be nutritious, with the addition of some stimulant. The remedies above recommended may be used. Salicylic acid, salicin, or digitalis will be found beneficial. Oil of gaultheria may be applied locally to the skin. Ergotine can be employed hypodermically if necessary.

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[1] Annales de Dermatologie et de Syphililogie. February, 1891.

Purpura Hemorrhagica or Werlhof's disease is dangerous and often fatal, and demands active and energetic treatment. Rest in bed is imperative, with nutritious food and stimulation. Any of the remedies already mentioned may be employed. Normal salt solution may be used subcutaneously. Ergotine may be injected under the skin. Sulphuric acid lemonade, or aromatic sulphuric acid, given well diluted is useful, especially for intestinal hemorrhages. Adrenalin hydrochloride may be given by the mouth, or hypodermically; it may also be added to salt solution for hypodermoclysis. Digitalis and the tincture of iron often act promptly. Hypodermic injections of ergotine have also been followed by good results. Oil of turpentine, acetate of lead with opium, tannic and gallic acids, and large doses of quinine, have been used with success. Electricity is said to have proved serviceable after other remedies had failed. The external applications, already referred to, can also be resorted to with good effect.

In the "New York Medical Record" of August 22, 1903, Dr. MacAdam reports a case of fulminating purpura hemorrhagica which he believes was cured by the administration of adrenalin. At one time the child was almost moribund, unconscious, ashy white, and bleeding from the nose, stomach, lungs, bowels, and kidneys. Although the case was considered hopeless, 20 drops of adrenalin solution in a teaspoonful of water was given internally. At the end of fifteen minutes the child regained consciousness, and a little color appeared in the cheeks, the pulse becoming perceptible. At this time 10 drops more of adrenalin solution was employed, and later 10 minims of it was given every three hours in orange juice. The illness of the child continued for several weeks, although gradual improvement took place. Three weeks later the adrenalin was discontinued, and the child was able to walk on the street with her parents, and was entirely well.

Blackburn reported the following case (American Medicine, July 11, 1903).

The patient, a man twenty-seven years old, was seized without known cause with severe epistaxis, the bleeding being continuous and free. In two hours he showed perceptibly the loss of blood. Packing with gauze saturated with cocaine hydrochloride gave but little relief. Ten hours after the seizure, the nasal cavity was packed with gauze saturated in adrenalin chloride 1:2000. This checked free bleeding, but oozing continued. Thirty-six hours after the onset, blood was passed in the urine, and ecchymoses appeared on the tongue, mucous membrane of the mouth, and all over the surface of the body. In the twenty-four hours following this the patient passed 50 ounces of dark bloody urine and was in a state of semicollapse. The first treatment of calcium chloride was stopped when general bleeding appeared, and adrenalin chloride 10 minims 1:1000 was given every two hours.

The subsequent favorable course seemed to indicate that the adrenalin had been given to good effect. The ecchymosis did not increase, circulation improved, the quantity of blood in the urine decreased until at the end of a week it had entirely disappeared.

Pick, of Vienna, has successfully treated five cases of purpura hemorrhagica with lemons, a little arsenic in the shape of Fowler's solution and aspirin being also given to two of them. Six to ten lemons a day were administered, and no ill effects were noticed, except that in the larger quantities they produced a mild purgation. Two of the cases had developed in connection with malaria, and it is interesting to note that in the Roman Campagna stewed lemons form a popular remedy against the disease, the fruit being sliced with the peel, and the filtrate taken by the tablespoonful. The lemon juice appeared to act promptly, though two of the cases of purpura were very severe. Hitherto the employment of the lemon in purpura has been chiefly confined to those cases in which there is also a scorbutic element, and here, together with lime juice, it has met with great success. When scurvy is out of the question it cannot be the antiscorbutic properties of the lemon which give it its efficacy, but rather some astringent principle which acts directly upon the vessels.[1]

TRUE SCURVY requires fresh air, vegetable acids, fresh vegetables, fruits, lime-juice and fresh meats. Quinine, iron, and strychnine are serviceable remedies. The condition of the gums and mouth may be promptly relieved by chlorate of potassium taken internally, and used also as a mouth wash.

**Prognosis.**—In purpura simplex the prognosis is always favorable, although recovery may be tedious. Purpura rheumatica likewise inclines to recovery. It is, however, obstinate, liable to frequent relapses, and may remain indefinitely. Purpura hemorrhagica is dangerous and often fatal, and in many cases it is impossible to foretell its termination.

## HEMOPHILIA.

SYNONYM.—Hemophilia, Bleeder's disease.

Hemophilia is a congenital, frequently hereditary affection, consisting in a proneness to profuse, and sometimes uncontrollable hemorrhages from the skin and mucous membrane. Men are more frequently affected than women. These bleedings may take place spontaneously, or follow some slight injury. Swelling of joints sometimes coexists with the hemorrhage. Bleeders rarely attain old age. In some instances, the disposition is gradually lost after the twenty-fifth year. Microscopic examination the blood and vessels has shown no apparent change, yet probably the vessels are at fault as well as the blood, which is deficient in plastic, or coagulated principles. According to Virchow and Immerman, the walls of the blood-vessels are abnormally thin. The treatment consists in large doses of tincture of iron or fluid extract of ergot. The solution of adrenalin, $(^{1}/_{1000})$ is also a useful remedy, administered by the mouth or hypodermically. Locally the same styptics may be employed with compression. Bleeding from small wounds, such as the alveolus after extraction of a tooth, may be stopped by packing with plaster of Paris, and applying a little pressure. A combination of cocaine hydrochloride and adrenalin solution, applied on a cotton or gauze compress, and held firmly on the bleeding surface will usually check the hemorrhage. Cold douches or applications of ice are also valuable. A. E. Wright has obtained encouraging results from the use of calcium chloride and carbonic acid, separately or in conjunction, and also the administration of nucleo-albumins. Calcium chloride is employed both internally and locally, satisfactory results having followed the application of finely powdered chalk mixed into a paste with a half-per-cent. solution of calcium chloride. He also prepares a "physiological styptic" by adding one per cent. of calcium chloride to the fibrin obtained by whipping freshly drawn blood. The carbonic acid is administered by leading a stream into the nose through a rubber tube, care being taken that enough oxygen is also supplied. The local application of a solution of nucleo-albumins was also found of service. After the attack, the patient should take for a period, large doses of iron and codliver oil, with hypophosphites, and a nutritious diet. The prognosis should be guarded.

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[1] Medical Press, Sept. 9, 1903.

## HEMATIDROSIS.

SYNONYMS.—Hemidrosis—Sudor sanguineus, or bloody sweat.

Hemidrosis is characterized by escape of fluid containing blood through the sweat-glands. The discharge is generally small in quantity, and the condition localized. Bleeding hysterical stigmata and neurotic excoriations are only forms of hematidrosis. The disease is seen most frequently in hysterical women, and during menstrual derangement. Debility of the nervous system is also an exciting cause, and it has been known to follow outbursts of passion and great nervous strain. The treatment is similar to that of purpura. Belladonna is reported to have been successfully employed. Electricity in the form of galvanism, or static electricity is of signal service in many instances, largely on account of its mental effect.

# CLASS IV.

# SPECIFIC INFLAMMATIONS.

*(Exudationes.)*

## RUBEOLA.

SYNONYMS.—Morbilli—Masern—Rougeole—Measles.

RUBEOLA or Morbilli is an acute, contagious, febrile, self-limited disease, characterized by a papular eruption over the surface, and accompanied by catarrhal inflammation of the mucous membranes of the respiratory passages.

**Symptoms.**—After an incubative period of nine to eleven days, in some cases protracted to the fifteenth, nineteenth, or twentieth day, the disease commences abruptly with chilliness or general malaise, followed in a few hours by fever, headache, muscular soreness, and symptoms of a severe cold. The eyelids are swollen and the eyes are injected and watery. The nasal mucous membrane is dry and tumid at first, but soon becomes the seat of a free seropurulent discharge. Sneezing is frequent. The pharyngeal and laryngeal mucous membranes are red and swollen. An eruption of small round lesions occurs at this time, according to Koplik, upon the buccal mucous membrane, consisting of very small bluish-white spots situated upon a reddish base. This is regarded as of value for early diagnosis, as it is believed to be pathognomonic of measles. There is a harsh, dry cough, and substernal tenderness. The face is flushed, the pulse accelerated. The urine is high-colored; the bowels are constipated. The temperature rises rapidly, often reaching 103° or 104° Fahr. on the evening of the first day. It then remains stationary until the end of the second or the beginning of the third day, when a marked remission occurs, the temperature falling to almost normal. The headache now lessens, but the other symptoms do not abate. The eyes become more swollen and sensitive to light, and lachrymation is profuse. The voice is hoarse and husky; respiration is increased. The bronchial mucous membrane usually becomes involved, and the sensation of soreness and constriction in the chest is decided. Coughing is frequent and painful, and auscultation reveals the presence of numerous mucous râles. This remission lasts about twenty-four hours, when the temperature rises again to its former height, and remains there until the eruption has been fully developed. The cutaneous lesions usually appear on the fourth day, but may be delayed until the fifth, and consists of a widely distributed rash, composed of numerous coarse, red papules, which vary in size from a pin's head to a small shot, and which are frequently aggregated into small groups. In rare instances the outbreak of the rash has been postponed until the eighth or ninth day. These groups of papules are somewhat crescentic, and are slightly elevated. They are generally noticed first on the face and chest, but spread in twenty-four hours over the entire surface. They are developed more abundantly upon the face, where they are arranged in clusters. In some cases, adjacent papules coalesce, forming large, irregular, crescentic blotches. The eruption remains at its height for about forty-eight hours, when it commences to fade in the order of its development, and usually disappears in two or three days. A slight discoloration may remain for a week or two at the site of each papule; more or less desquamation in small scales follows. The febrile and catarrhal symptoms decline when the eruption begins to fade, so that convalescence, as a rule, takes place in ten or eleven days from the beginning of the disease. A slight bronchial cough, however, may remain for a week or two longer, and there is frequently an attack of broncho-pneumonia or croupous-pneumonia during convalescence.

In more severe cases, all the symptoms are aggravated with the development of the eruption. The temperature rises to 105° or 106° Fahr., the inflammation spreads to the finer bronchial tubes, or even to the lung-structure itself, producing capillary bronchitis or pneumonia. Diarrhea may appear, and the urine become scanty and albuminous. Conjunctivitis, iritis, and otitis also sometimes occur. Epistaxis occasionally takes place either during the prodromic or eruptive period. Herpes zoster, pemphigus, optic neuritis, inflammation of Cowper's glands, enlargement of tracheo-bronchial glands, tubercular meningitis, ovaritis, peritonitis, hematemesis, hemoptysis, and acute nephritis are among the rarer complications. Measles and urticaria pigmentosa have been known to coexist. Gangrene of the skin, especially of the mouth or vulva, is occasionally seen in debilitated children suffering with measles. Endocarditis has been met with as a complication, and Sansom mentions a case in which chorea, pericarditis, and endocarditis developed during convalescence from an attack of measles. Heart clot, followed by pulmonary edema, is of serious complications in the latter stages, especially in children, may be heralded by convulsions, and such cases are apt to be fatal. Rare sequelæ are paralysis, muscular atrophy, Pott's disease, and corneal ulcers.

In the very severe form known as hemorrhagic, or black, measles, the eruption is dark red or purplish in color, and so abundant as to almost cover the entire surface. The temperature rises to 106° or 108° Fahr., the pulse is rapid and feeble, the breathing shallow and irregular, and the catarrhal symptoms intense. The tongue is brown and dry, and the teeth are covered with sordes. Blood oozes from the gums and lips, and hemorrhagic extravasations appear beneath the mucous and cutaneous surfaces. The urine is scanty or suppressed, and offensive or bloody discharges take place involuntarily from the bowels. The patient soon becomes comatose, or passes into a low, muttering delirium. Death may ensue on the second or third day after the appearance of the eruption. Cases are occasionally met with in which measles coexists with or overlaps some other exanthem—as, for instance, chicken-pox, scarlet fever, or typhoid fever. Measles sometimes precedes or follows rötheln.

During the wide-spread and severe epidemic of measles which prevailed in Paris in 1890, Dr. Cauvet closely studied the buccal phenomena and complications. Two varieties of lesions may occur, one directly dependent upon the infection of the disease, and another due to accidental infection, which has no direct relation, but is a complication. The manifestations which depend upon the infection of measles are: 1. Buccal erythema, generally at the same time as the nasal catarrh, and which may attack the tongue, and is often followed by desquamation of the tongue; 2. Follicular stomatitis from glandular hypersecretion, together with obstruction of the excretory ducts. The superadded diseases or complications are: 1. Muguet; 2. Aphthæ; 3. Ulcerative stomatitis; 4. Diphtheria, which, in consequence of the desquamation following buccal erythema, often primarily attacks the tongue; 5. Gangrene of the mouth, a severe and rare complication.[1]

**Diagnosis.**—The diagnosis of measles is comparatively easy. The only diseases for which it might be mistaken are variola, rötheln, typhus fever, and influenza. In *variola*, however, the eruption appears on the third day, respectively in the following order: papular, vesicular, and pustular. There are no catarrhal symptoms, and the fever of small-pox declines as soon as the eruption appears. In *rubella* the eruption is not seen until the fourth or fifth day, and never becomes vesicular or pustular, but always remains papular until its disappearance. The catarrhal symptoms are marked, and the fever, which remits on the second or third day of the disease, becomes aggravated prior to or during the appearance of the eruption, and remains high until all the papules have come out. In doubtful cases, a day's delay will usually enable an accurate diagnosis to be made. Further, Belfadel[2] calls attention to the peculiar location of the first signs of catarrhal conjunctivitis in the incipiency of measles. In 78 out of 111 patients he noted this phenomenon as the first sign of the disease. Instead of commencing as usual in the conjunctival cul-de-sac and spreading thence over the conjunctiva, the first signs of inflammation are noticed in that part of the bulbar conjunctiva which is exposed, close to the cornea. This is the point where pterygium usually develops. The measles conjunctivitis spreads in one or two days over the rest of the conjunctiva, but its appearance at this point may differentiate the disease in its earliest stages.

In *rötheln*, the eruption may appear at any time during the first three days of the disease, but it is irregularly distributed over the surface, and consists of rose-colored spots and blotches, which are unlike the coarse crescentic papules of rubeola. In rötheln, moreover, the fever and catarrhal symptoms are comparatively insignificant, and bronchitis, pneumonia, and the other complications of rubeola, do not usually occur.

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[1] Archives of Pediatrics, February, 1891.

[2] "Conjunctivitis in Early Diagnosis of Measles." (Nuovo sintoma precoce dei morbillo.) A. Belfadel.

In *typhus fever*, the eruption is coarsely papular and also petechial, but is scanty, and limited to the body and limbs, never appearing upon the face. There are no catarrhal symptoms, but the cerebral are intense. The remission of the fever on the second or third day, and the appearance of the eruption on the fourth day, are sufficient to distinguish rubeola from influenza or epidemic catarrh, which exhibits also marked nervous symptoms.

**Pathology.**—The pathological changes in rubeola consist of intense hyperemia of the capillary vessels of the cutaneous papillæ, followed by a slight serous exudation into the surrounding tissue. The respiratory mucous membranes also become actively congested, and dotted with dark-red spots, apparently similar in character to the cutaneous manifestations. The dark color of the eruption, in the malignant variety, denotes profound changes in the blood. The hemorrhagic extravasations are due to rupture of the capillaries. In some cases the spleen is swollen and hyperemic, and the kidneys enlarged and filled with blood.

**Etiology.**—Rubeola may occur sporadically or as an epidemic. It prevails in all countries and at all seasons, but most frequently during spring and autumn. It is a disease of childhood, but occasionally observed in adults. Infants less than six months of age are not usually attacked; although Dr. Carstairs Douglas describes the case of an infant attacked on the tenth day after birth.

Measles is produced by a micro-organism, which is probably a specific micrococcus, and is very contagious. It may be readily communicated not only by actual contact, but also by wearing apparel and other articles used by the patient. It is also spread by atmospheric diffusion. It may be communicated by injecting the blood taken from a patient with measles into a healthy individual. The disease is highly contagious, and spreads rapidly among children, unless they are protected by a previous attack. It occasionally is met with in adults, and especially among elderly persons, who happen to be exposed to contagion. It would be more common among adults if it were not for the fact that most persons are immune, owing to having passed through the disease in childhood. The secretions of the nasal and broncho-pulmonary mucous membranes and the epithelial scales, appear to be the principal agents in spreading the disease. The malady is due to the growth of a specific micro-organism, and is contagious at all periods, from the prodromic period to the termination of desquamation. One attack usually confers immunity for life, but occasional exceptions are seen. A second attack, or relapse, also sometimes occurs soon after recovery. Dr. Battye witnessed three successive eruptions, the second and third beginning when the preceding one had nearly faded. During epidemics cases exceptionally occur without any eruption on the skin whatever (*Morbilli sine eruptione*).

**Treatment.**—The patient should be given a diet chiefly of milk-toast and light soups, and encouraged to drink moderately cold water and lemonade. The room should be well ventilated, but not too cold and the face and neck sponged with cold water four or five times a day. The eruption is less profuse, and the symptoms are less severe, if the room be slightly darkened, especially by red curtains, which exclude the actinic rays of light. Should there be other children in the house, of a weak or scrofulous constitution, it is prudent to send them away; if otherwise healthy, they may be permitted to remain and experience an attack of the disease and thus acquire immunity from further contagion. The medicinal treatment should be directed to moderate fever and catarrhal symptoms, alleviate cough, promote expectoration, and prevent development of further complications.

In ordinary cases I usually direct the (adult) patient to take:

| | | |
|---|---|---|
| ℞ Tinct. aconiti | ♏xl. | 2.65 |
| Syr. ipecac | fʒss. | 2. |
| Syr. scillæ. comp. | fʒij. | 8. |
| Syr. lactucarii | fʒx. | 40. |

M. Sig.: One teaspoonful every four hours.

I also order the following powders, one to be taken every second or third night at bedtime:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. mitis | gr. iij. | 0.18 |
| Resinæ jalapæ | gr. vj. | 0.36 |
| Pulv. sacchar. | gr. x. | 0.60 |

M. Ft. chartæ. No. vj.

If restlessness is exhibited, five to ten grains (0.30 to 0.60 gm.) of sodium bromide may be given three times a day, or from two to five grains (0.12 to 0.30 gm.) of Dover's powder at bedtime. In the more severe cases, when the fever is high and the eruption scanty or late in development, ice-bags should be applied to the head, and the patient placed in a cold bath or wet pack, if necessary. The compound acetanilide powder may be used to reduce the fever, and relieve headache and restlessness; as it is less depressing than acetanilide alone. Either may be combined with quinine, in capsules, and given with good results. Phenacetin is preferable to acetanilide because less depressing to the circulation, but all the coal-tar preparations should be given cautiously in the eruptive fevers, especially to young children.

When the eruption begins to decline, and the febrile and other symptoms abate, it is good practice to give from three to ten grains (0.18 to

0.60 gm.) of quinine daily, for a week or more. A stimulating expectorant mixture, like the following, is advisable during convalescence:

| | | |
|---|---|---|
| ℞ Tinct. capsici | ♏v. | 0.30 |
| Tinct. sanguinariæ | fʒss. | 2. |
| Tinct. nucis vomicæ | fʒss. | 2. |
| Tinct. cinchonæ comp. | f℥iij. | 96. |

M. Sig.: Half a teaspoonful to a teaspoonful four times a day, well diluted.

In black measles, or the malignant variety of rubeola, the high temperature should be reduced by the wet pack or cold bath, and turpentine, quinine, and the tincture of the chloride of iron freely administered. Benefit has also been derived from the use of camphor and the carbonate of ammonia. Phenol and chlorate of potassium have also been recommended.

On account of the liability to buccal complications, Cauvet advises the free use of disinfectant mouth-washes from the very beginning of the disease. A saturated solution of boric acid will be found of service, which may be flavored and made more antiseptic in its effects by the addition of cinnamon, gaultheria or peppermint. Tincture of myrrh with sodium phenolate, or the antiseptic solution of the Pharmacopeia, may be used with advantage. Dr. L. Bard[1] states his conviction that broncho-pneumonia is not due directly to the measles, but to a secondary infection to which the exanthem predisposes. Since broncho-pneumonia may readily become engrafted even upon mild cases, Dr. Bard lays stress upon the importance of rigid separation of complicated from uncomplicated cases. As an illustration, he compares the general harmlessness of a mild epidemic in one of the French cantons, with the fatality attendant upon the broncho-pulmonary complications, in a certain limited locality. Separation of the two varieties is particularly demanded in hospital practice, as is shown by the fact that in the Hôpital des Enfants Assistés, where cases of measles are placed in a special ward, the average mortality between the years 1867 and 1872 is stated to have been 42.59 per cent., attaining a maximum of 60.81 per cent. in 1871.

The complications of rubeola must be met as they arise. In pneumonia and capillary bronchitis, turpentine, carbonate of ammonia, and stimulants will be found indispensable. Counter irritants to the chest, of hot flaxseed poultices containing a little mustard, are also useful. When the bronchial tubes are clogged with mucus, emetics will be of service. When the urine becomes suppressed, free diaphoresis and purgation should be produced. If diarrhea occur, opium and the mineral acids are indicated. Anemic or scrofulous patients should be given codliver oil, potassium chlorate, quinine, and other tonics, for months after convalescence, in order to restore tone of the system.

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[1] Lyon Médical, January 13, 1889.

**Prognosis.**—The prognosis is favorable in simple, uncomplicated cases except in young children under five years of age. In England, measles causes the greatest mortality in children between one and two years of age. In America it does not prevail to such a great extent. It may appear epidemically in camps of soldiers and crowded institutions. It is believed that in the early history of this country, repeated epidemics of measles occurred among the Indians attended by a very large mortality. In our large cities it appears that, generally speaking, the deaths are due rather to pneumonia and other complications than to the disease. According to Professor J. M. Anders, the mortality differs with the surroundings. In healthy children under favorable environments, the mortality is practically *nil,* while in tuberculous and wasted children it is very large. This being especially due to complications and sequelæ. The disease is more fatal when it follows other acute infections such as scarlatina. On the other hand, vaccination with cowpox is said to mitigate the attack of measles and shorten its duration. As a rule, the older the patient the severer the case. The course of measles is said to be less severe in vaccinated persons. Weak and scrofulous persons are extremely liable to iritis and otitis. They are also peculiarly liable to develop phthisis after convalescence. There are on record three cases in which paralysis of the recurrent laryngeal nerve followed measles.

The malignant or purpurous variety of rubeola or black measles is very dangerous. Over one-half of the sporadic cases end fatally, and when it occurs in an epidemic form over ninety per cent. of those affected die.

## RUBELLA.

SYNONYMS.—Rötheln—German measles—French measles.

Rubella is a mild, contagious, febrile disease, characterized by an eruption of rose-colored spots and blotches of various shapes and sizes, on the general cutaneous surface.

**Symptoms.**—After an incubation period of ten to sixteen days, sometimes only three or four days after exposure to contagion, the disease usually begins with a slight fever, accompanied by moderate headache and general *malaise.* The pulse is accelerated, and the temperature varies from 99° to 101° Fahr. The mucous membrane of the fauces and tonsils is reddened and tumid, and there is some stiffness and soreness at the angle of the jaws. More or less sore throat or tonsillitis is usually present as a complication. Some writers mention the occurrence of distinct rose-red spots about the size of a large pin's head, seated upon the soft palate and tonsils, coincident with the beginning of the exanthem, and fading within twenty-four hours. These may be the only lesions present. In some instances, the eruption is limited to certain areas of the surface of the body.

In many cases the conjunctiva is injected, and there is increased lachrymation. The cervical glands below the angle of the lower jaw, are usually swollen. The eruption generally appears on the first or second day; but may not be observed until the third. In some cases, the constitutional symptoms are so slight that the first evidence given is the appearance of the rash. It consists at first of a number of small, round, rose-colored spots, which turn white on pressure. They vary in size from a pin's head to a small pea, are arranged in clusters, and slightly elevated. They generally appear at first on the face and scalp, and then rapidly extend over the remainder of the body. Some of the clusters on the body and limbs coalesce, forming large, irregularly shaped red blotches; but the facial spots almost invariably remain discrete. The eruption attains its maximum in twenty-four hours. It remains stationary for a day or two longer, and then, beginning with the face, it commences to fade, disappearing completely from the body on the fifth or sixth day of the disease. Slight discoloration may remain for a short time at the site of each spot, but free desquamation rarely occurs. The febrile and other symptoms pass away with the eruption.

**Diagnosis.**—The only diseases with which rubella could be confounded are scarlatina, measles, and erythema symptomatica. In *scarlatina*, however, the fever is higher, the throat symptoms are more intense, and the eruption consists of a diffused scarlet efflorescence, which appears first on the neck and chest, and then spreads over the whole body. In *measles* the eruption is crescentic and coarsely papular. It appears on the fourth day of the disease, and is accompanied by a marked exacerbation of the fever. Severe coryza and bronchitis are also present.

In *erythema symptomatica* the spots are rose-colored, but they are larger in size and fewer in number than those of rubella, and they rarely appear on the face. They are usually secondary to some gastric derangement, and are not accompanied by febrile or catarrhal symptoms.

**Pathology.**—An active congestion of the capillaries of a number of groups of the cutaneous papillæ occurs, but exudation does not ensue, and the discoloration usually disappears when the congestion subsides. In some instances the skin remains discolored for a time at the site of the lesions.

**Etiology.**—Rubella is almost exclusively a disease of childhood, but it may develop in adult life and this occurs much more frequently than with measles. It is produced by a specific poison, and propagated by contagion. One attack is protective against the subsequent development of rubella, but will not secure immunity from measles or scarlatina.

**Treatment.**—The majority of cases do not require medical treatment but rest and a light diet, and confinement to the house for a few days. In the more severe form, as it may be in adults, where the patient is restless and decidedly feverish, and complains of sore throat, a mild diaphoretic mixture should be ordered, and the bowels opened freely by a saline laxative and suitable mouth-washes given as in measles.

**Prognosis.**—The prognosis is almost invariably favorable.

## SCARLATINA.

SYNONYMS.—Scarlet fever—Scarlet rash—Fiévre pourprée—Scharlach-fieber.

Scarlatina is an acute, extremely contagious, febrile disease, characterized by the development of a diffused scarlet rash over the whole or the greater part of the body, accompanied by inflammation of the throat, and also by various nervous phenomena, and terminating in free desquamation of the outer layers of the epidermis. Evidence is accumulating that the disease is due to a protozoan parasite, somewhat similar to that of malaria; while its complications are due to streptococcal or diplococcal secondary infection. It is frequently complicated by diphtherial infection of the throat.

**Symptoms.**—There are three well-marked varieties of the disease: scarlatina simplex, scarlatina anginosa, and scarlatina maligna. The invasion is exceedingly brief in all three varieties. The period of incubation varies from three to seven days; that of contagion extends from the beginning of the initial fever until about a week after all febrile symptoms have disappeared and all the scales shed.

In scarlatina simplex the disease is ushered in by a slight chill, or by an attack of apparently causeless vomiting; or, in nervous children, by convulsions. These symptoms pass away in an hour or two, and are immediately followed by fever, which soon becomes high. The face is flushed, the skin hot and dry, the pulse rapid and full, and the respirations become more frequent. The urine is scanty and high-colored, contains albumin in severe cases, and casts; and the bowels are usually constipated. The tongue is red at the tip and edges, but covered in the centre with a white or yellowish fur. The throat is reddened, the cervical glands are enlarged, and there is some pain on swallowing. More or less headache and restlessness are also present. The temperature varies from 101° to 103° Fahr., with a slight morning remission and evening exacerbation. The pulse varies with the height of the fever and the age of the patient. In some cases it reaches 130, in others it does not rise above 100.

The characteristic eruption usually appears on the second day of the fever. It consists of a fine pale-red or scarlet efflorescence, which appears first on the face and neck and upper part of the chest, and within twenty-four hours diffuses over the entire surface of the body. In some cases it may present at first a punctated appearance, but it is not elevated, and it disappears upon pressure and the discrete spots generally soon become confluent, or merged in the general hyperemia of the surface. The eruption is most intense in the flexures of the joints. In exceptional instances small vesicles are seen either in isolated patches or scattered over the entire surface of the body. A rare manifestation has lately been described by Professor F. C. Curtis[1]. On the fourth day after the appearance of a typical scarlatinal eruption, a vesicular rash developed upon various parts of the body, the vesicles varying in size from a pin's head to that of a split pea.

During the development of the rash, the throat symptoms increase in severity, and the tongue becomes red and papillated, forming the characteristic "strawberry tongue" of the disease. The fever is uninfluenced by the eruption, and remains at its height until the fifth or sixth day of the disease, when it begins to decline. The throat symptoms also lessen, the restlessness passes away, and the eruption disappears first from the face and neck, and then from the other portions of the body. The period of decline usually occupies about three days, so that the eruption and the fever disappear and the patient enters convalescence on the eighth or ninth day of the disease. Some desquamation of the epidermis occurs, but it may be so slight as almost to escape notice, or to produce only a roughened appearance.

In severer cases the mode of onset is the same, but all the symptoms are more intense. The infection here is of a mixed character; virulent streptococcus or staphylococcus forms being present. The fever may reach 105° Fahr., the pulse ranging from 110 to 140; the fauces and tonsils become red, swollen, and covered by a pultaceous deposit. Swallowing is difficult and painful. The urine is dark-colored and albuminous, and more or less delirium is present. Convalescence does not begin until the ninth or tenth day, and is accompanied by considerable desquamation.

In scarlatina anginosa, the temperature may reach 107° Fahr., the pulse varying from 120 to 160, but the throat symptoms are prominent early in the attack, and soon become intense. Many of these cases will be found to have the bacillus of diphtheria in their throats. The cervical glands are hard and swollen. The fauces, tonsils, and pharynx become inflamed, swollen, and covered by an offensive tenacious deposit. Superficial ulceration occurs at various points, rendering deglutition painful or almost impossible. In some patients the mucous membrane lining the posterior nares and Eustachian tubes become involved, resulting in serious impairment of smell and hearing. In a majority of cases of this type the disease reaches its height about the eighth or ninth day. The fever then slowly lessens, the swelling of the mucous membrane subsides, the ulcerative process ceases, and reparative action begins. The eruption also gradually disappears, so that the convalescent stage begins about the fourteenth day. The desquamation is usually profuse, and may continue for several weeks. Occasionally the hair and nails are shed. In unfavorable cases the tonsils and fauces become enormously swollen, or attacked by gangrene. The temperature rises rapidly, and the symptoms assume a typhoid type. The pulse becomes small, rapid, and feeble, the respiration quick and irregular. The urine is suppressed or scanty and albuminous. Coma alternates with delirium, and death takes place from exhaustion, toxinemia, or uremic poisoning.

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[1] Albany Medical Annals, February, 1891.

In scarlatina maligna, the temperature is extremely high from the beginning, frequently rising to 110° Fahr. Here the secondary infections are extremely virulent. The pulse varies from 150 to 200. The respiration is irregular and sighing. Convulsions are frequent, but in some cases the patient lies profoundly comatose. The throat is swollen, and covered by a membranous deposit. The glands of the neck are enlarged. The eruption is developed in dark-red or purplish patches, and may not appear until the fourth or fifth day. Sometimes hemorrhages take place in the skin and mucous membranes. Recovery is rare; death usually occurs about the third or fourth day.

Anomalous cases or irregular forms of scarlatina are occasionally encountered. Dr. Wertheimer and others have reported cases in which all the symptoms of scarlet fever were present, with little or no elevation of temperature. The pulse, however, was very rapid, and Wertheimer suggests that a persistently rapid pulse without fever is of diagnostic value in these rare cases of apyrexial scarlatina. Under the designation of *scarlatina sine eruptione*, cases have been described in which the throat symptoms and fever occur, but the eruption is absent. Dr. W. R. Lee, of Barneston, Neb., witnessed a number of cases occurring epidermically, having the symptoms and sequelæ of scarlet fever without the rash. Dr. Heller, of Hamburg, has described a case of inverted type, beginning with nephritis and ending with the classical eruption.

In certain cases, hyperpyrexia develops without any complication, but with great disturbance of the nervous system. Sudden death may supervene on the third or fourth day of the eruption, the symptoms being unexpected loss of consciousness, high fever, rapid pulse, and dyspnœa. In serious and complicated cases, peptone and sometimes indican have been found in the urine. The occurrence of peptonuria is an unfavorable omen. In rare instances relapse has been observed.

Dr. D. Astley Gresswell demonstrates that the severity of an epidemic may vary from month to month. Endocarditis was not seen in any of his patients attacked with arthritis who had not previously suffered with rheumatism. There was no case of arthritis in children under three years of age. Purulent arthritis occurs in some cases. In exceptional instances the articular structures are rapidly destroyed. The bones as well as the joints are sometimes affected. The bone may remain thickened and muscular atrophy may occur. The disease of the joint may be followed by ankylosis. In Marsden's experience the wrist-joint is most frequently involved. This complication generally occurs during or shortly after defervescence. Myositis, ushered in by a brief rise of temperature, has occasionally been observed after disappearance of the acute symptoms of scarlatina. The larger muscles were those usually affected.

Meyers instances a number of cases in which prickling or numbness of the hands occurred with or without slight paralysis of the upper extremities, generally simultaneous with, but sometimes preceding, the eruption. J. B. McConnell witnessed the development of tetany on the eleventh day after the commencement of scarlet fever.

The coexistence of scarlatina and typhoid has occasionally been witnessed. In the experience of Dr. E. MacDowel Cosgrave, of Dublin, the severity of neither disease seems to be increased by this concurrence. The relation of scarlatina to pregnant and puerperal women has been investigated by Boxall. He infers that predisposition or susceptibility to the disease is greatest during the first week after delivery. A few cases develop shortly before the beginning of labor. During or after parturition, the stage of incubation is short, but during pregnancy this stage is longer than normal. Angina is usually present during pregnancy; but is infrequent when the disease occurs after labor. If parturition take place during an attack, the uterine contractions are feeble and there is a tendency to hemorrhage. Scarlatina in a puerperal woman diminishes or suppresses the milk. An attack during pregnancy may or may not bring on miscarriage or affect the fetus.

Itching is often present in scarlet fever. The prognosis may be regarded as favorable in cases attended by pruritus. The tables of Dr. Caiger show that desquamation may continue from six to sixteen weeks. It is generally slight and of short duration in infants. Scarlatina sometimes follows traumatism, especially in children.

The mortality from scarlatina among children under five years is nearly five times as great as among those between ten and fifteen. In 3,497 cases there were 362 cases of otitis, 338 of rhinitis, 867 of albuminuria, 55 of measles, 36 of whooping-cough, and 25 of diphtheria. Other complications liable to occur are adenitis, rheumatism, eczema, bronchitis, and conjunctivitis. In a series of 4,000 cases in St. Catherine's Hospital, Stockholm, a few were complicated by meningitis due to aural disease. Richardière has recorded the case of a child in whom pulmonary gangrene developed during the subsidence of scarlatina.

**Sequelæ.**—Dropsy, rheumatism, and otitis are the most frequent. Chorea and valvular or other cardiac diseases have been observed. The otitis is usually purulent, and may result in permanent deafness; but a spontaneous cure may follow after months or years; but at any time the infection may extend along the blood-vessels into the brain, and set up pyemic phlebitis and local abscess, which is generally fatal. In a few instances the labyrinth has been primarily affected, giving rise to prolonged suppuration, necrosis, and facial paralysis. Scarlatinal rheumatism is generally subacute, but may be acute. Dropsy is the most important and frequent sequel. It generally appears when desquamation has been well established. In some cases it is developed after exposure to cold, but frequently occurs without any apparent cause. Scarlatinal dropsy is due in most cases to acute Bright's disease, but in a small percentage to slight congestion of the kidneys. The urine is scanty, albuminous, and high-colored, but rarely suppressed. Recovery is the rule. Dr. C. Henry Willey believes that these cases may be divided into three main groups. In the first nervous and vascular causes, and in the second influences of a more general character, are responsible for the albuminuria. In the third group, inflammation of the kidney is present. In the first class the prognosis is favorable. In the second group, fever, diarrhea, and delirium were prominent. When dependent upon acute nephritis, the albuminuria begins as a trace and steadily increases. Septic phenomena occurred in consequence of suppuration of cervical glands, in a case reported by Caiger. In a case observed by Fruitnight, scarlatina was followed by sloughing of the neck, and death from rupture of an artery. J. C. Wilson described a case in which gangrene both of the face and sacral region, occurred. Gangrene of both legs was observed by Littlewood. Two cases have been reported in which multiple neuritis followed. Dr. J. S. Price has described a case of suppurative appendicitis consecutive to this fever. Mr. John Ewens met with spontaneous dislocation of the hip and necrosis of the tibia in scarlatinal rheumatism. After scarlatina, certain diseases of the skin occasionally develop, as acne, urticaria, pemphigus, ecthyma, pustular eruptions, etc.

**Diagnosis.**—It has been said that scarlatina can be diagnosticated during the prodromal stage, by the extreme rapidity of the pulse. This will not hold good in all cases. The rapidity depends directly upon the age of the patient and the height of the fever, and not upon the precise nature of the disease. I have seen cases of scarlatina in children in which the pulse never rose above 100. On the other hand, I have observed many with ephemeral fever, in which the pulse varied from 120 to 150. Still, if the pulse is 120 or over, and the fever has been preceded by convulsions, or there is an attack of causeless vomiting, scarlatina may be suspected, and the patient should be isolated, in order to prevent the possible spread of the disease. After the eruption has appeared, the diagnosis is easy. The high fever, the sore throat, and the diffused scarlet efflorescence appearing on the second day, form a trio of symptoms which point unerringly to the true nature of the malady. *Roseola* and *rubella* are characterized by the development of irregular scarlet blotches which present a superficial resemblance to the eruption of scarlatina, but the high fever and throat symptoms of the latter disease are absent. In *dengue*, or break-bone fever, the eruption is red and diffused, and the temperature high, but the joints are swollen and painful, while the throat is not involved. The rash of dengue which generally appears first upon the hands, wrists, and forearms, may occur at any time from the first to the fifth day of the disease. It is not characteristic, but assumes a number of forms, and is, in many cases, altogether absent. In some cases of *measles* the eruption consists at first of a large number of bright-red spots, which when closely aggregated present a striking resemblance to scarlatina, but elsewhere on the surface may be found the crescentic patches and coarse papular eruptions of measles. Early in the case, there may be found a bluish petechial eruption in the mouth, inside the cheeks and on the hard palate. In measles, there are no throat symptoms, but coryza and bronchitis are present, and the eruption appears on the fourth day; and, if not papular when first observed, becomes so within a few hours.

**Pathology.**—The eruption of scarlatina is produced by active congestion of the capillaries of the papillary layer of the corium. The differences in the intensity of the color in various regions of the body are due to variations in the intensity of the morbid process. Exudation of serum does not occur to any marked degree, but the dilated blood-vessels compress the surrounding tissues and narrow the calibre of the lymph-spaces, so that the nutritive supply of the epidermis is diminished or cut off. The exfoliation or desquamation which follows is due in great part to this interference with nutrition, and probably in part also to a disturbance of the terminal filaments of the trophic nerves. It may be so slight as to escape notice, or merely produce a roughened condition of a portion of the surface, or it may be profuse and continue for months after convalescence. In some cases the skin peels off in large flakes; in others, the hair falls out and the nails drop off. The epidermic scales contain the infectious microorganisms in virulent form. The hemorrhagic extravasations which occur in scarlatina maligna are due to rupture of the capillary vessels.

The mucous membrane lining the pharynx, and the buccal cavity becomes hyperemic and swollen. The tonsils become enlarged and covered with a purulent exudation. In severe cases suppuration ensues, or a diphtheritic membrane is formed, and rapidly extends to the adjacent structures. The diphtheria bacillus usually is present in the virulent cases, existing as a secondary infection. The false membrane is not always of true diphtheritic character, according to the researches of MM. Wurtz and Bourges, who examined material taken from the throats of nine children in whom the angina was severe. In all these cases the streptococcus pyogenes was found associated with other microbes of suppuration. The authors conclude that the early throat trouble of scarlet fever, however severe, is not, in the great majority of cases, of a diphtheritic nature. A family came under the observation of Mr. J. Holroyde, of Chatham, England, in which, within about a month's time, diphtheria and scarlatina alternately attacked three different children.

Ulceration of the soft palate and Eustachian tubes, followed by destruction of the tympanum, may occur. Edema of the pharynx or larynx may be produced by the infiltration of serum, and either seriously interfere with breathing or suddenly prove fatal. In other cases suppurative inflammation of the areolar tissue, followed by the formation of abscesses in distant portions of the neck, has been observed. Granular degeneration of the gastric tubules and of Peyer's patches often follows. Pneumonia, bronchitis, pericarditis, or endocarditis may take place. Dr. Carlsson, of Stockholm, in several post-mortem examinations, found alterations in the cardiac muscle, myocarditis, fatty degeneration, etc. The changes in the kidneys vary with the type of the disease. In malignant cases they appear paler than normal, but dotted by a few minute hemorrhages. When death is deferred for several days, more hemorrhagic spots will be found, and occasionally minute abscesses. These are the cases in which death ensues before the development of dropsical symptoms. The dropsy is due usually to acute parenchymatous nephritis, and sometimes to simple congestion of the kidneys. In the latter, the kidney-tubules are filled with the endothelium which has been exfoliated. The capillaries are engorged and tortuous, and the cortical substance presents evidences of beginning granular degeneration.

**Etiology.**—Scarlatina may occur sporadically or in the form of an epidemic, but never originates spontaneously. Now and then a case occurs in which it is difficult, or, it may be, impossible, to discover the source of infection. Such a one has been placed upon record by Surgeon-Major R. D. Murray, of the British army, serving in Bengal. Scarlatina is excessively rare in India, and it is said that there is no record of an authentic case occurring in a native. Dr. Murray's patient was a young English lady, who resided on a lonely indigo plantation, who had not been in Europe for six years, and had not, as far as could be learned, received letters or parcels from infected houses in England. The cows from which the family's milk was obtained were carefully examined, but no traces of disease could be discovered upon their teats or udders.

Scarlatina is always produced by a specific poison which is probably protozoan in character, and contained in the breath, in the saliva, in the epidermis, and in the excretions of scarlatina patients. Streptococci, which resemble each other, but which may or may not be identical, have been isolated from the blood of scarlatina by Dr. W. J. Class, of Chicago, by Adolph Baginsky and Paul Sommerfeld, and have been thought by their respective discoverers to be probably the cause of the disease, but are now held to represent a secondary or mixed infection, as they are completely absent in some typical fatal cases. (Hektoen). Recently Gabritschewsky[1] emphasizes further the fact that streptococci and streptococcal vaccines may cause scarlatiniform eruptions, which result he holds to be strong evidence in favor of the streptococcus being the specific cause of scarlet fever. Scarlatina may be communicated by the breath before the eruption has made its appearance. Contagion is active until the close of the desquamative period. This poison is extremely diffusive, and attaches itself to the clothing, furniture, carpets, and other articles in the room, and even to the walls of the apartment. Contagion is also spread by means of picture-books, letters, and clothing of patient, nurse, or even physician. The medical attendant should therefore take every precaution to disinfect his clothing and person before visiting another juvenile patient, or a woman in labor. The poison is also wafted from place to place by the atmosphere. It is exceedingly tenacious of life, and may retain its activity for years. The virus, however, unless carried by a current of air, does not extend many feet from the patient. Hence, isolation is of more value in scarlatina than in many other contagious affections. There is reason to believe that propagation is largely due to atmospheric diffusion of the epidermic scales of patients. Dr. L. H. Miller has reported twenty-four cases in which the origin was traced to drinking infected milk. Its development is favored by bad hygiene and weakened vitality. Scarlatina may occur at any age, but is most frequently met with between the second and twelfth year, and rarely observed after the fortieth year. Out of 854 cases tabulated by the Superintendent of Health of Providence, in 1889, over fifty-seven per cent. occurred in children between the second and eighth years. It has occasionally been transmitted to the fetus *in utero*. An instance of this fact has been communicated by Dr. W. B. Dorsett, of St. Louis, Mo.[1] A woman had suffered from a mild attack of scarlet fever about two months prior to delivery at full term. The child's skin at birth presented typical desquamation, furfuraceous upon the trunk, arms and legs, and scaly upon the palms and soles. A few similar cases have been recorded. One attack is protective, as a rule, against subsequent attacks, but exceptions have been noticed. A second invasion occasionally occurs within a short period. Townsend Barker has recorded an instance of a patient who suffered from two attacks of scarlatina within three months. The disease occurs most frequently in early autumn.

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[1] Berl. klin. Wochschr., 1907, No. 18.

Schools undoubtedly exercise a great influence in communicating scarlet fever among young children and children of school age are the most frequent source of infection in infants and adults. The most frequent period of incubation, according to B. K. Goldsmith, is two days, three coming next.[2]

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[1] St. Louis Medical and Surgical Journal, February, 1888.

[2] "The Influence of School Life on the Spread of Scarlet Fever." The Lancet, June 29, 1907.

**Treatment.**—An appropriate diet is of the utmost importance. The patient's stomach should not be overloaded, but his vital forces must be sustained. With this end in view a moderate quantity of milk, milk-toast, beef-juice, or light, nourishing soup should be given regularly every four hours through the day. In order to prevent the spread of the disease, if there are other children, not yet exposed, they should be sent away, and the patient placed in a cool, well-ventilated room, as near the top of the dwelling as possible. All clothing, carpets, pictures, and unnecessary articles of furniture should be removed from the chamber, and no one but the physician and nurse permitted to enter until convalescence has been well established and the room thoroughly disinfected. The clothing and playthings, and all other articles that have been in contact with the patient should be disinfected or destroyed, the epidermic scales collected and burned, and the saliva and excreta disinfected and removed as soon as possible.

Dr. J. Lewis Smith, of New York, recommends[1] that the room of the patient should be continuously disinfected by means of the following mixture:

| | | | |
|---|---|---|---|
| ℞ Phenolis liquefacti, | | | |
| Ol. eucalypti | āā f℥j. | 32. | |
| Ol. terebinth | f℥vij. | 224. | M. |

This forms a mixture of no decidedly unpleasantly odor. Two tablespoonfuls are to be added to a quart of water, in a flat-bottomed tin vessel, and kept simmering over a gas or oil stove. Great care should be taken that the mixture does not boil, or it may ignite.

Medicinally, the aim should be to secure the elimination of the poison, moderate the intensity of the fever, alleviate the throat symptoms, and prevent the occurrence or lessen the severity of the cerebral, renal, and other complications.

In ordinary cases of scarlatina simplex, I usually begin the treatment by directing from half a teaspoonful to a dessertspoonful of the following mixture to be taken every four hours, according to the age of the patient:

| | | |
|---|---|---|
| ℞ Tinct. aconiti | fʒj. | 4. |
| Potassii chloratis | ʒss. | 2. |
| Infus. digitalis | f℥iij. | 96. |

M. Adult dose, two teaspoonfuls in water every four hours.

I also order three powders, each containing one grain of calomel and five grains of bicarbonate of soda, one powder to be taken every other night. I advise the entire body to be sponged three or four times a day with cold water, and to be thoroughly anointed every morning with a mixture composed of ten minims of oil of peppermint and three ounces of codliver oil.

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[1] Archives of Pediatrics, December, 1890.

During the febrile stage, inunction moderates the fever. The use of an unguent during desquamation hinders dissemination of the scales, and therefore checks the spread of the disease. Since the scales from the scalp are fine and shed early, inunction should be applied to the head as well as to other portions of the body. Instead of the foregoing combination, the formula of Dr. J. Lewis Smith may be used:

| | | |
|---|---|---|
| ℞ Phenolis liquefacti, | | |
| Ol. eucalypti ........................ | āā f℥j. | 4. |
| Ol. olivæ ............................ | f℥vij. | 224. |

M. For application to the general surface of the body once a day.

An ointment of lanolin with solution of hydrogen dioxide, is refreshing and antiseptic.

The throat symptoms are generally light, and can usually be alleviated by permitting the patient to swallow small pieces of ice from time to time, or to drink freely of cool water. When the fever subsides, which generally occurs on the fifth or sixth day, I discontinue the aconite mixture, and substitute the following prescription, to be taken in the same doses and in the same manner:

| | | | |
|---|---|---|---|
| ℞ Tinct. nucis vomicæ ............ | ♏ xij. | 0.78 | |
| Tinct. digitalis ................ | fʒss. | 2. | |
| Potassii chloratis ............... | ʒss. | 2. | |
| Aquæ ........................ | f℥iij. | 96. | M. |

Three or four days later, when convalescence is established, I place the patient upon quinine, chloride of iron, or other tonic treatment. In cases of greater severity, presenting high fever with delirium, difficulty and pain in swallowing, I increase the amount of aconite and digitalis, place ice-bags to the head and throat, and follow the calomel and soda with a purgative dose of sulphate of magnesium or of soda.

M. Vidal, of Hyères, uses acetate of ammonium in large doses, one gramme for each year of the child's age, the maximum dose for adults being thirty-five grammes.

In scarlatina anginosa, the fever and delirium can be moderated in the same manner. Phenacetin is valuable when the temperature is very high, though it should be cautiously used, or not at all, when there is a tendency to marked depression of the vital powers. The throat symptoms require vigorous treatment. The offensive pultaceous deposits should be removed by mopping the surface or gargling four or five times a day with a solution of common salt, chlorate of potassium, boric acid, or thymol. The solution of dioxide of hydrogen may be diluted with water, and a few drops of antiseptic solution (U. S.P.) added, and this mixture used frequently as a mouth-wash. Corrosive sublimate, two grains (0.13 gm.) to the pint (512 gm.) of water, is also efficacious. It may be used as a gargle or a spray every second hour. The same solution may be advantageously applied to the nasal mucous membrane when it is red, swollen, and the seat of a discharge. The dioxide of hydrogen, applied in the form of a spray, every half hour, or hour, during the day, is another good remedy, used in the proportion of one part to four parts of water, or, of alkaline antiseptic solutions, in case it should be too acid. The nares should be disinfected, either by dioxide of hydrogen, one to eight, or the wash recommended by Dr. J. Lewis Smith, in the article already referred to, of which the formula is:

| | | |
|---|---|---|
| ℞ Acidi borici. | ʒij. | 8. |
| Sodii borat. | ʒij. | 8. |
| Sodii chloridi | ʒj. | 4. |
| Aquæ puræ | Oj. | 512. |

M. Sig.: One teaspoonful to be injected warm into each nostril hourly.

The application of a five- or ten-per-cent. solution of resorcin in glycerin is also a good procedure.

If the swelling of the tonsils becomes excessive, they should be painted with tincture of the chloride of iron or a thirty-grain (2 gm.) solution of nitrate of silver. If suppuration occurs, the pus should be let out at once. If a diphtheritic membrane forms on the tonsils or fauces, equal parts of the solution of chlorinated soda and water should be used as a gargle, or applied, full strength, to the affected surface with a camel's-hair brush. Benefit can also be obtained by gargling with yeast or with a solution of capsicum. Immediate and permanent improvement sometimes follows the use of an emetic of ipecac, apomorphine hydrochloride or of common salt and water. The stomach is emptied by this means of a mass of foul pus which has gradually oozed down into it, and, without this precaution, would be absorbed into and poison the general system, and the membrane is also detached from the pharynx and fauces, and a clean surface left, to which appropriate applications can then be made. If edema of the pharynx, or of the glottis, occurs, the affected part should be freely scarified, or tracheotomy performed. Ulcerations of the tonsils, fauces, and soft palate can be treated by the application of a five-grain (0.30 gm.) solution of nitrate of silver. In cases of scarlatina in which the pulse is quick and feeble, aconite should not be employed. Instead, I give small doses of turpentine or of belladonna and digitalis every three hours, and from one-half to two grains (0.03 to 0.12 gm.) of quinine with half a grain (0.03 gm.) of capsicum every four hours. Camphor or carbonate of ammonia may sometimes be used with benefit. According to Dr. Illingworth,[1] the biniodide of mercury will yield excellent results.

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[1] Provincial Medical Journal, August, 1886.

In the "British Medical Journal" for October 26, 1889, Mr. J. Brendon Curgenven warmly praises the internal and external employment of the volatile oil of eucalyptus. He administers it in one- to four-drop doses every four hours in an emulsion. Externally the remedy is atomized and vaporized in the sick-room and applied to the patient's body by inunction night and morning for the first few days, subsequently at night only until ten days have elapsed. Dr. Shakowaki claims excellent results from the administration of salicylic acid. He states that in 125 grave cases, occurring in children, the mortality under this treatment was but three and a half per cent.

Barkes and subsequently De Rossa have attributed prophylactic powers to salicylic acid in scarlatina. The latter administered it in daily doses of from one and a half to four and a half grains (0.09 to 0.27 gm.) according to age to sixty-six children who had been exposed to contagion, and in only three cases did the disease develop. He believes that given in time and in sufficient quantity it is capable of averting an attack, while if employed too late in too small a dose it mitigates the severity of the disease. It has been objected to the use of salicylate of sodium, however, that it is liable to produce relapse or excite nephritis. Sulphonal is reported as being useful in the relief of restlessness and insomnia, but is a dangerous drug in young children.

In scarlatina maligna every effort should be made to reduce the high temperature—the cause of all the other complications of this variety of the disease. The patient should be placed in a cold bath, or wrapped in a wet pack and ice applied to the head and neck. The bowels should be freely opened, and aconite, veratrum viride, or other arterial sedatives promptly administered. After the temperature has been reduced to the safety limit, the treatment may be conducted in the manner indicated for the other varieties of the disease.

In the treatment of 3,460 cases, Reimer made use in 278 of different forms of hydrotherapy. According to this large experience, cold compresses or cold envelopment exerted a favorable influence upon the respiration and circulation, but little upon the temperature. In cases attended by cyanosis, stupor, and collapse, cold envelopment combined with affusions of water having a temperature of 12° to 14° C. (53.6° to 57.2° F.) generally gave good results, but did not lower the temperature. Immersion in a bath of 12° to 14° C., however, frequently caused the temperature to fall 2° C. After being removed from the bath, the patients were rubbed briskly and wrapped in a woolen blanket. Of antipyretic drugs this writer derived most benefit from antipyrin, but advises that it be used cautiously, as it is liable to produce collapse. The same remark should be made concerning the use of acetanilid and phenacetin, which are not devoid of toxic influence. Cases have been reported in which these agents have also produced collapse. In the employment, therefore, of all the coal-tar products in this disease, especially in children, they need be administered with great circumspection.

In scarlatinal dropsy, small doses of infusion of digitalis and acetate of potassium may be given with benefit, and the patient permitted to drink water and cream-of-tartar lemonade freely, but stimulating diuretics should be avoided. Diaphoretics and hydragogue cathartics are mainly to be relied on to secure the elimination of effete material, and relieve the engorged kidneys. The steam, or hot-air, bath is a valuable adjunct. In addition, leeches or cups are useful, applied to the lumbar region. The convulsions that occur in the early stages of scarlatina are due to cerebral congestion arising from the height of the fever or the excessive arterial pressure, and can be relieved by the application of ice to the head, and the administration of purgatives and arterial sedatives; chloral and the bromides are also of service. Convulsions in the later stages of the disease are usually due to uræmic poisoning from the suppression of urine, and can only be relieved by free diaphoresis and catharsis, followed by a reestablishment of the functions of the kidneys. In cases complicated by diphtheria, the antitoxin injections are now regarded as necessary. The patient should be properly isolated, and all cloths used as handkerchiefs should be burned. The use of Marmorek's antistreptococcic serum has been advocated; but in my opinion and experience it has disappointed expectation. Gabritschewsky[1] introduced the use of injections of dead streptococci for curative as well as preventive purposes in this disease. The use of the dead streptococci in the prevention of scarlet fever has been reported in many cases from Russia.[2]

Dr. Pulawski, of Radziejov, writing[3] in the "Deutsche Medizinische Wochenschrift," reports the results obtained in scarlet fever by the subcutaneous injection of serum, which was produced by the inoculation of horses with streptococci cultivated from the blood of severe cases of scarlet fever. Of 35 severe cases treated with this serum 28 per cent. died, whereas of 28 severe cases treated without the serum 71 per cent. died. The serum proved to be quite innocuous and did not cause any undesirable symptom beyond a slight urticaria. Among the patients treated with serum there were ten deaths; these cases had, however, from the first, been regarded as hopeless. In the remaining cases favorable action of the serum was shown by the rapid development and shortened duration of the exanthem, by mitigation of the grave symptoms, and by a quicker convalescence. It is probable that the serum protects the patients against complications such as otitis, lymphadenitis, and nephritis. In two cases complicated by diphtheria the joint administration of scarlet fever serum and diphtheria serum was useful.

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[1] Centrlbl. f. Bakt., 1906, xli, p. 719.

[2] Zlatogoroff: Centrbl. f. Bakt., 1906, xlii; Nidrigailow, *ibid;* Langoway, *ibid;* Perwoff, Schamarin, Nikitin, Russky Wratch., 1907.

[3] London Lancet, Feb. 15, 1908.

**Prognosis.**—The prognosis varies with the type of the disease and the age of the patient. The average mortality in all cases has been estimated from seven to ten per cent. In some virulent epidemics over half of those who are attacked die in spite of all treatment. Cases of scarlatina simplex generally recover. The greatest danger in this form of the disease is from the late nephritis, which may be severe in an otherwise mild case. The majority of patients, however, recover under appropriate treatment, even after the dropsical accumulation has become extensive. A guarded prognosis should be given in the cases of adults and very young children. Pregnancy also exerts an unfavorable influence.

In scarlatina anginosa, the prognosis is always grave, but from twenty-five to fifty per cent. usually recover.

Scarlatina maligna almost invariably terminates fatally.

## VARIOLA.

SYNONYMS.—Small-pox—Blättern—Variole—Petite verole.

Variola is an acute, specific, contagious, febrile disease, characterized by the development of an eruption which is papular at first, but speedily becomes vesicular, and then pustular.

There are four well-marked varieties—variola discreta, variola confluens, variola maligna, and varioloid—all of which are preceded by a period of incubation, varying from five to fourteen days.

**Symptoms.**—VARIOLA DISCRETA.—This form of the disease is generally ushered in by a moderate chill, accompanied by a dull, aching pain in the lumbar regions. The pulse is small and feeble, the face pale, and there is more or less nausea. The chill is of short duration, and is usually succeeded, in an hour or two, by fever, which soon becomes high. The pain in the lower portion of the back increases in severity as the temperature rises, and extends into the hips and thighs. The respiration is increased, the face is flushed, the conjunctivæ are injected, and more or less headache supervenes. The patient is disinclined to take food, but suffers from thirst. The tongue is coated with a thick, white fur, the stomach becomes disordered, and vomiting is frequent. The skin is dry and hot. The urine is scanty and high-colored, micturition is painful, and the bowels are constipated. The patient is restless, and in some cases slight delirium occurs. The temperature may reach 106°, but usually ranges between 103° and 104°, with a slight morning remission and an evening exacerbation. The pulse varies in accordance with the height of the fever. In adults it ranges from 100 to 140, and in children from 120 to 180. About the end of the third or the beginning of the fourth day, of the fever, the characteristic eruption appears. It consists of a number of coarse, reddish, papular spots, which feel like particles of small shot imbedded in the skin. They are hard, and slightly elevated above the surrounding surfaces, and become pale on pressure. They first appear around the lips and on the cheeks and forehead, and then on the chest and arms and remaining portions of the body. They may also appear on the pharynx, larynx, trachea, and other mucous surfaces. They are isolated, or may be arranged in clusters, as in the corymbic variety, but they do not manifest any disposition to coalesce, as in variola confluens. Soon after the eruption appears the fever declines, the nausea, headache, and backache become less severe, and, in mild cases, almost completely disappear. The papules, however, produce more or less itching and discomfort. Ordinarily, they are all developed within twenty-four hours, and no new ones appear after that time. On the second day of the eruption, or the fourth or fifth day of the disease, the top of each papule may be observed to present a vesicular appearance, and, on the following day, each papule is completely transformed into a vesicle which contains a clear, serous fluid. The vesicles increase in size until the fourth or fifth day of the eruption, which corresponds with the seventh or eighth day of the disease. They are then surrounded by an indurated inflammatory areola, and present an umbilicated appearance. Their contents undergo a marked change at this time, first becoming turbid, then milky, and finally purulent in character. This process marks the beginning of the stage of suppuration, and the transformation of the vesicles into pustules, and is accompanied by marked symptomatic or secondary fever. The temperature rises higher than ever, even reaching 105° or 106°. The pulse and respiration increase in a corresponding ratio. The headache, backache, nausea, and vomiting return in an aggravated degree. The pustules enlarge, and the surrounding skin becomes intensely swollen. The mucous membrane lining the nasal passages and the buccal and pharyngeal cavities is irritated and inflamed. Swallowing is painful, and bronchitis, pneumonia, or pleurisy may occur. Some of the pustules rupture spontaneously, or from the pressure of the clothing; others are torn by the patient in his endeavor to obtain relief from the heat and itching. The remainder begin to dry up about the eleventh day of the eruption, or the fourteenth day of the disease. A dark-brown spot appears in the centre of each, which increases in size until it forms a brown crust or scab which covers the whole area of the pustule, and is firmly adherent to the underlying surface. The febrile symptoms lessen as soon as the process of desiccation commences, the tumefaction gradually disappears, and the patient passes into the stage of convalescence. The process of healing continues beneath the scabs, but, as more or less of the corium is destroyed by the suppurative process, minute cicatrices or pits are formed at the site of each pustule. The scabs finally drop off about the sixth or seventh day after desiccation begins. The surface is then seen to be roughened and reddened; the face is especially disfigured. The hair frequently falls out during convalescence, and the nails occasionally drop off.

Variola Confluens.—This variety is marked by the greater severity of the symptoms of every stage of the disease, and by the earlier development and confluent character of the eruption. The initial chill is violent and protracted, and is the precursor of others. The primary fever, the backache, headache, and gastric disorders then follow in painful succession. Delirium is usually present, and convulsions may occur. The eruption appears on the third day, and in a few hours spreads over the whole body. Adjacent papules coalesce to form large elevations, which are soon transformed into broad blebs filled with a sero-purulent fluid. The face presents an extremely repulsive appearance. The mucous membranes are also involved. The fauces, pharynx, naso-pharynx, larynx, and tongue become swollen and covered with pustules, and edema of the glottis may result. The parotid and sublingual glands are likewise affected. The conjunctiva and cornea suffer, with sometimes ulceration and perforation of the latter. Erysipelas is a frequent complication of this variety, and extensive sloughing and gangrene often ensue. The temperature, which may reach 107° during the primary fever, falls only slightly or not at all when the eruption appears, and rises higher than ever when suppuration begins. The urine is scanty and loaded with albumin. Pneumonia, bronchitis, and pleurisy often occur. The disease may assume a typhoid type, ending with suppression of urine and uremic poisoning. A few recover after protracted convalescence, but with more or less deformity from the destruction of tissue by suppuration and sloughing. Paraplegia, disseminated spinal sclerosis, suppurative peritonitis, and ovaritis are occasional complications or sequelæ.

Variola Maligna.—Variola maligna is characterized by the intensity of its symptoms and the irregularity of their development. The initial chill is very severe, and is followed by violent fever, the temperature rising during the first day to 108° or 110°. The respiration is quick, feeble, and irregular. The pulse is rapid and tremulous, varying from 120 to 170. The face and neck are deeply suffused. The headache and backache are distressingly severe. Vomiting is constant. The urine is scanty or suppressed. The bowels may be loose. Delirium is usually present, but in some cases the patient is apparently comatose. In many cases a scarlatiniform or an erythematous eruption known as the "initial rash," appears on various portions of the body on the second day of the disease. On the third day, the characteristic papular eruption appears and rapidly becomes diffused over the entire surface, but the fever does not subside. The papules, black or dark-blue in color, increase in size, and become surrounded by hemorrhagic extravasations, which may vary in size from a pin's point to an inch or more. Those adjacent coalesce, forming large, irregular masses. The face is swollen and distorted, the conjunctivæ are injected, and the eyelids are turgid with blood. The tongue is thick and coated. The buccal and pharyngeal mucous membrane is covered by a purulent hemorrhagic exudation, from which a sickening odor emanates. Bronchitis or pneumonia is usual. Hemorrhage from the stomach or the bowels is not infrequent. The urine is loaded with albumin, and finally becomes dark and bloody. Death generally takes place in this variety of the disease between the third and the eighth day after the development of the initial symptoms. Indeed, some malignant cases end fatally before the appearance of the eruption, in which event the body turns black.

In a contribution on hemorrhagic variola as observed in Paris in 1887, M. de Grandmaison describes a comparatively benign form which he terms cutaneous hemorrhagic variola. The hemorrhages are limited to the pustules, the eruption is discrete, constitutional reaction is not extreme, and recovery generally takes place.

VARIOLOID.—Varioloid is a mild or benign form of variola, occurring in those whose susceptibility to the action of the disease has been modified by vaccination or by a previous attack of variola. It is ushered in by a slight chill, followed by a moderate fever. The characteristic lumbar pain is also present, but not severe. There are also slight headache and nausea. The papular eruption is apt to be a day late, appearing on the evening of the fourth day, rather than on the third, and is accompanied by complete relief from the other symptoms of the disease. The number of papules vary from five or six to a hundred or more. They increase in size, and are converted first into vesicles, then into pustules. Many of the latter become aborted as soon as formed, and the remainder are rarely more than half-filled with pus. The suppurative process is consequently very short, and the secondary fever is absent. There is a slight inflammatory areola around each pustule, but the adjacent skin is not swollen. The mucous membranes may be involved, but only slightly. Desiccation commences from the fifth to the seventh day of the eruption, or the ninth to the eleventh day of the disease, and is usually complete in four or five days. The majority of the pustules dry up without rupturing, and, as there is not much destruction of tissue, there is usually little or no pitting. Convalescence is generally rapid. Some cases are so mild that the patient does not suspect the nature of the disease until informed of it.

Gubler and Robin have determined that, in variola, urea is generally increased during the first few days. The increase may be more marked in light than in severe cases. Uric acid is usually increased in the early stage and diminished after the occurrence of suppuration. During the stage of invasion the quantity of urine is diminished and its density increased. The chlorides, at first diminished, are increased during suppuration. Phosphoric acid progressively increases from the beginning and diminishes suddenly with the cessation of the fever. The sulphates increase slightly during the course of the disease. Valerianic acid, fatty acids, leucine, and tyrosine have been detected. In severe cases indican is increased. The liquid and non-crystallizable extractive matters are increased, and from them Pouchet has obtained a very toxic ptomaine.

**Diagnosis.**—While it is impossible to make a certain diagnosis of variola before the eruption, the occurrence of high fever, vomiting, and severe lumbar pains, preceded by a chill, are highly significant, and may be considered pathognomic if the patient has been exposed to the contagion of the disease, or if other cases have previously been observed in the neighborhood. During the first few days a coarse erythematous, or petechial, initial rash may be observed especially around the flexures of the larger joints. When the eruption is fully developed, the diagnosis is comparatively easy. The only diseases with which it could then be confounded are measles, scarlet fever, varicella, typhus fever, and pustular syphilis. The papules of variola bear a superficial resemblance at first to those of *measles*, but the former become vesicular within twenty-four hours, and then pustular, while the latter remain unchanged. M. Grisolle states that while the papular stage of the eruption may present a very similar appearance, if the papule become impalpable to the touch when the skin is stretched, the eruption is caused by measles; whereas, if the papule is still felt when the skin is drawn out, the eruption is due to small-pox. The papules of measles are also larger than those of variola, and are crescent-shaped. The constitutional symptoms are also widely different. In variola the temperature is high during the initial stage, and falls to nearly normal when the eruption develops. In measles the temperature is only moderately high during the initial stage, and rises rapidly a few hours before the eruption appears, and remains at its maximum height for from twelve to twenty-four hours after the rash is all out. Measles is invariably accompanied by a "watery eye," and other symptoms of coryza. More or less bronchitis is also present. Coryza is absent in variola, and bronchitis occurs only as a complication of the later stages. The malignant form of variola is frequently preceded by an erythematous rash which might be mistaken for that of *scarlet fever*, but it is less diffused and more irregular in development, and is followed in a few hours by the characteristic papular eruption. The gravity of the constitutional symptoms is also significant.

The vesicles of *varicella* may resemble those of variola, but they begin as vesicles, and remain as such until they dry up. They appear on the second day of the disease. They are usually developed upon the body and scalp, and are rarely seen upon the face. The accompanying constitutional symptoms are very slight. The eruption of typhus fever is either macular or papular in character. It appears from the fifth to the seventh day of the disease, and is never seen upon the face.

The pustules of *syphilis* have been mistaken for those of small-pox. Several years ago a sailor, who was covered from head to foot with pustular lesions, was sent to the Philadelphia Health-Office as a small-pox patient.

The attendant physician, recognizing the nature of the malady, immediately procured his admission in the Hospital for Skin and Venereal Diseases. Several other physicians had previously seen the case and pronounced it one of small-pox. Inquiry into the history of the patient, and a consideration of the symptoms presented by him, would have rendered the mistake impossible.

In syphilis a history of infection can usually be obtained, and an examination will reveal some traces of the primary sore or its accompanying bubo. The eruption, moreover, is seldom purely pustular; macules, papules, vesico-pustules, and other lesions usually coexisting in varying numbers. In some rare cases, however, as the one just referred to, it consists solely of pustules identical in appearance with those of variola. The patient may also be weak and feverish, and complain of pain in the back and loins. The elevation of temperature does not exceed one or two degrees, however, and the constitutional symptoms partake more of the nature of general *malaise* than of a violent infectious disease. Further, the pustules in syphilis are chronic in character, often remaining for some time, and are not accompanied, as a rule, by pain or itching. In variola, the fever is high, the prostration profound, and the eruption is acute in character, accompanied by intense itching, and disappearing by maturation in from eleven to fourteen days.

**Pathology.**—The first step in the production of the eruption consists of active congestion of the capillary vessels of a number of the papillæ of the corium. Exudation then takes place into the connective tissue and the rete mucosum, by which the outer layers of the epidermis are elevated and papules formed. As the inflammatory process continues, more fluid oozes out, the epidermic layers are separated from each other and from the corium, and vesicles result. The contents of the vesicles consist at first of pure serum, but in a day or two pus-corpuscles transmigrate, and the former become transformed into pustules. The umbilicated appearance which they present is due to the fact that the epidermis in the centre of each pustule is continuous with the duct of a hair-follicle or a cutaneous gland. The pus does not differ, microscopically, from that of any ordinary inflammation. Guttmann found it to contain the ordinary microbes of suppuration, to the action of which he attributes the cutaneous lesions, though they fail to account for the contagion.

In variola confluens great numbers of adjacent papulæ become involved. The hemorrhagic extravasations of the malignant variety are due to rupture of cutaneous vessels. The dark or purple color which the papules and extravasations sometimes assume is significant of dissolution of the blood. The pustules which form on the mucous membranes may incite general catarrhal, croupous, or diphtheritic inflammation of the regions in which they are found. After death, the liver, spleen, kidneys, and heart are found to be the seat of granular and fatty degeneration.

Pustules have rarely been observed upon the gastric mucous membrane. Dr. James Nevin Hyde, however, records the fact that in an autopsy made by himself "there was no portion of the alimentary canal from the mouth to the anus which was not studded by thickly set pustules."

**Etiology.**—Variola occurs at all ages and in all countries. It is produced by a specific poison. Analogical reasoning would lead us to conclude that the source of the infection is to be found in a specific microorganism and recent investigations render it probable that the specific cause is an animal parasite belonging to the class of sporozoa, although the organism has not yet been identified with certainty. Le Dantes isolated a streptococcus which he calls variola-coccus. This organism was found constantly present in the blood, viscera, and pustules of more than fifty cases. Dr. Walter Reed, of the United States Army, found an ameboid parasite in the blood of variola and vaccinia. Councilman, Magrath and Brinckerhoff[1] have recognized a member of the sporozoa class of protozoa as the cause of small-pox. It appears first in the lower layers of the epithelial cells of the skin as a structureless body from one to four microns in diameter. At the time of segmentation, small round or oval ring-like bodies appear in the nucleus. These increase in size and acquire a definite structure consisting of a series of vacuoles around a large central vacuole. The intranuclear body eventually entirely destroys the nucleus, and later the cell itself ruptures, setting it free. The intranuclear body becomes transformed into a number of circular ring-like bodies with central dots. The latter are evidently spores from segmentation of the intranuclear body. This is a further stage of development of the intracellular body, and represents the second complete cycle of development. The spores are regarded as the infecting material of variola. In vaccinia the second cycle of development does not occur.

They believe that in the contents of the vesicles and pustules they have seen forms of the intranuclear bodies which seem to show that the intranuclear cycle is sexual in character. The organism has received the name of *Cytoryctes Variola*, in recognition of its protozoan character. These microsporidia may be detected in the skin and the blood during the period of incubation and afford an opportunity of recognizing the disease a week or two before the eruption appears on the skin. This should be of great assistance to early diagnosis.

One attack is protective, as a rule, against subsequent outbreaks of the disease, but exceptions occur. A few recurrent cases have been reported in which the symptoms and eruption of small-pox reappeared a few days or weeks after recovery from the first attack. Vaccination affords almost complete protection. Variola is highly contagious. It may be communicated by inoculation with the contents of the pustules, but is spread principally by the diffusion through the atmosphere of the emanations from the patient. It may also be conveyed by domestic animals, by letters and by clothing.

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[1] Journal of Medical Research, May, 1903, p. 372.

Small-pox may be transmitted from the mother to the fetus, and the death of the latter be followed by abortion. Small-pox may attack the fetus *in utero* while the mother escapes. In the case of a German woman reported by J. H. Franklin,[1] of Spring Valley, Illinois, who had been waiting upon her husband during an attack of variola, she had been recently successfully vaccinated and apparently escaped infection. Two weeks afterward she gave birth to a fetus at full term, which was covered with a typical small-pox eruption in the pustular stage, and deeply umbilicated. The child had been dead for several days. The mother showed no sign of infection and made an uneventful recovery. The transportation of rags often conveys the virus from one country to another, and Dr. Matthew Hay has reported a case in which raw flax and jute acted as the carrier of infection from Russia to Aberdeen. Variola is infectious at every stage, from the beginning of the disease until the process of desquamation has been completed, but it is especially dangerous during the period of suppuration, when the secondary fever is at its height. The poison is active and virulent, and retains its power for a long time. Even contact with the bodies of those who have died with the disease may result in its development. The clothing and other articles in contact with the patient become saturated with the poison, and, unless destroyed or thoroughly disinfected, will become fomites, or the foci for future epidemics.

An apposite example of the mode of infection and the length of time during which infected rags remain virulent is given by Dr. W. F. Suiter, of La Crosse, Wisconsin. A man convalescent from a broken leg, but still confined to bed, was seized with small-pox. Upon inquiry it was found that he had pulled out from the wall near his bed a piece of rag which covered a wooden pin, and had idly picked the rag to pieces. It was afterward learned that a family had died of variola in the same room twenty-eight years previously, and the rag had in all probability been handled by one of those patients. Dr. J. N. Hurty, secretary of the State Board of Health, concerning the death of Miss Minnie Peterson, of Scipio, Indiana, reported that his investigation disclosed the fact that 39 years previously the girl's father had died of the same disease. His old clothes were packed in a chest which had been preserved. Two weeks before the death of Miss Peterson, she had opened this old chest, not knowing what it contained. In the meantime all the relatives of the girl had died and no one warned her about its contents. It was stowed away in an attic room where it had remained almost half a century. Yet it contained the deadly germs which were destined to cause Miss Peterson's death.

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[1] Medical Record, Sept. 5, 1903.

Even after the girl had died the family could not understand where she had contracted the disease, as there was no small-pox in the neighborhood. It was not until the investigation by Dr. Hurty that the cause of her death was discovered.

**Treatment.**—Diet is of the utmost importance. Milk, milk-toast, eggs, oysters, or beef-juice should be administered regularly every four hours from the beginning of the disease. Lemonade will be found agreeable and cooling, and may be given freely. Cold water or ice-water can be taken almost without restriction.

The medicinal treatment is mainly symptomatic, as no remedy has yet been discovered by which variola can be aborted or its duration lessened. Cerni and Ory have lately claimed admirable results from the use of cocaine in doses of from two to five centigrammes (one-third to three-quarters of a grain). Ory gives to adults ten drops of a five-per-cent. solution of hydrochloride of cocaine four times daily, and to children eight drops of a one-per-cent. solution four times a day. It is asserted that by this treatment the suppurative stage is remarkably abridged and ameliorated and pitting much reduced. Dr. Montefero, of Naples, has reported favorably of the internal employment of small doses of phenol or carbolic acid. He asserts that this drug aborts or limits pustulation and reduces fever. Adynamia is a contra-indication to its use, and it failed entirely in hemorrhagic variola. The sulpho-carbolates have been recommended by some authorities. Hydrochloric acid in doses of ten to twenty drops every two or three hours may be administered in order to assist digestion. Some practitioners rely upon the carbonate of ammonium.

During the stage of invasion the aim should be to lower the temperature, lessen the arterial tension, allay gastric irritability, and quiet the nervous system. In the stage of suppuration the treatment should be directed not only to meet the foregoing indications, but also to prevent or counteract the development of pyemic poisoning. The complications that arise at this period must be promptly met, and means taken to prevent or lessen the disfigurement caused by the formation of pits.

In ordinary cases the most efficient treatment consists in the administration of small doses of aconite and morphine during the primary fever, and the same drugs in alteration with quinine and tincture of the chloride of iron during the secondary fever. The bowels should be freely opened, in the beginning of the disease, by a purgative dose of calomel and soda, and one or two passages secured every day afterward by means of saline laxatives. If pharyngitis or other throat symptoms develop, the patient should be directed to use a gargle of chlorate of potassium, ten grains (0.60 gm.) to the ounce (32 gm.), four or five times a day. The bronchitis can be most effectively relieved by a combination of sanguinaria, capsicum, and squills, or other stimulating expectorants, rather than by opiates and depressants. Nervous exaltation can usually be allayed by the bromides and chloral, but in some cases full doses of Dover's powder will be more efficient. Occasionally it may be necessary to resort to the hypodermic use of morphine. Du Castel treats variola by hypodermic injections of ether night and morning and by full doses of the tincture of the chloride of iron, and extract of opium, which are increased in case of delirium. This method is adapted to relieve prostration, and is claimed to exert a favorable influence upon the eruption. The irritability of the skin is relieved by frequent sponging with cold water. Inunctions of codliver oil are also grateful. According to Dr. Galezouski, of Paris, excellent results are obtained in the small-pox hospital of Brunn, Austria, by continuous baths colored with permanganate of potassium. The temperature is reduced, the general condition improved, and the pustules undergo resolution.

Various antiseptic remedies have been used with the object of neutralizing the specific cause of the disease. The benzoate of sodium, it is said, reduces the temperature and modifies the severity of small-pox. Petresco commends the action of Van Swieten's solution. This consists of ten grains (0.60 gm.) each of corrosive sublimate and chloride of ammonium dissolved in a pint (512 gm.) of distilled water, the dose being from half to one drachm (2 to 4 gm.) repeated at proper intervals, the effect being carefully watched. Sulphurous acid has also its advocates. Pitting can be reduced to a minimum by keeping the patient in a cool, dark room, and applying tincture of iodine freely to each papule. An ointment containing iodol, thymol iodide, or sulphur may likewise be employed for the same purpose. Each pustule should also be punctured early, and the interior touched with nitrate of silver after the pus has been evacuated. This, however, is a tedious and painful process. The late Dr. Addinell Hewson, of Philadelphia, insisted that better results were obtained with less pain by covering the affected surface with a thick paste composed of fine clay and water. Weak mercurial plasters are frequently employed for a like effect. In order to lessen suppuration, Talamon makes use of an ethereal solution of corrosive sublimate applied in the form of a spray. The formula recommended is as follows:

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| ℞ Acid. citrici | gr. xv. | 1. |
| Hydrarg. chlor. corros. | gr. xv. | 1. |
| Sp. vini rect. (90°) | ♏ lxxv. | 5. |
| Ether | q. s. ad f℥xijss. | 50. M. |

For the first or second day of the eruption, the face is daily washed with soap and water, rinsed with borated water, and dried with absorbent cotton, after which the spray is used, the eyes being protected by borated cotton. The spray is directed upon the face for barely a minute. Fifteen minutes after the use of the spray, the face is rubbed with a pledget of cotton dipped in a glycerin solution of sublimate, half a drachm (2 gm.)

to the ounce (32 gm.). The spray may be discontinued after the sixth or seventh day, the glycerin solution being applied until the scabs begin to loosen. Schiermmer reports favorably of a paste composed of five parts of phenol, forty of olive-oil, and sixty of precipitated chalk. Colleville prefers an ointment consisting of one part of iodoform to twenty parts of vaseline. A plan described by Bianchi was attended by considerable success. The patient is first placed in a tepid bath containing one part in twenty of boric acid. During the bath he is covered with an antiseptic soap. This bath, or one of a 1:1,000 solution of corrosive sublimate, is repeated every fourth hour. After each bath, an ointment of iodoform and vaseline, of one to five per cent. strength, is applied. All the pustules are opened with an aseptic needle. The linen of the patient and the bed must be frequently changed; the floor, walls, and furniture washed every second day with a 1:200 solution of corrosive sublimate. Lotions of phenol or of mercuric bichloride relieve the tension of the skin and lessen the fetor. In the treatment of pregnant women suffering with small-pox, Richardière orders immersion once or twice daily, in a sublimate bath, the external parts being, in the meanwhile, kept covered with compresses saturated in Van Swieten's solution. Coste reports good results from the application of boric lint with slight pressure. The masks are kept moist by spraying with fresh lotion every four or five hours. It has long been known that darkness mitigates the severity of the eruption, and Gallavardin has called attention anew to the value of this plan. It has been suggested that the efficacy of darkness depends upon exclusion of the chemical or ultra-violet rays. This may be accomplished by the use of red window-panes or covering the windows with red curtains. Finsen,[1] Svendsen, Juhel-Renoy, and Feilberg have written favorably concerning this mode of treatment. Finsen states that when the patients come under treatment early enough, before the fourth day of the disease, suppuration of the vesicles, even in unvaccinated persons, will be avoided, an exception being noted of one case of confluent small-pox out of about seventy cases. When the patient comes under treatment after the fifth day of the disease, it is uncertain whether the suppuration can be avoided or not. The conditions which are absolutely indispensable to success are: (1) that the patient should come under treatment sufficiently early and (2) the chemical rays of daylight must be absolutely shut out. Another report favorable to this method of treatment has been published by Baer.[2] He used thick red curtains nailed over the windows. Spectroscopic examinations showed that only red light penetrated through them. All examinations were made with candle or lamp light. The degree of darkness in the rooms was such that it was still easy to avoid obstacles. In all, 18 cases were treated on Finsen's plan. In nine slight cases there was neither suppuration nor secondary fever. The effects were more distinct in the severe cases. In all patients the rapidity with which the vesicles dried up was remarkable. In two very severe cases the eruption remained vesicular. There was slight fever, but both cases ended fatally. This, Baer thinks, was chiefly due to the severe involvement of the mucous membranes. In several of the patients it was noted that, even though there was no suppuration, the vesicles became distinctly confluent. Baer considers that Finsen's claim is justified, that exclusion of white light and ultra-violet rays either entirely prevents the vesicles becoming pustular, or else restricts it to a very marked degree. On the severity of the infection itself, the red-light treatment has no effect. Baer's numbers were too small to enable him to say definitely whether the mortality is reduced. Certainly, the danger of marked pitting is distinctly lessened. In one case where on admission some of the vesicles had already become slightly pustular, the red-light treatment did not prevent the rest of the vesicles from becoming pustular, but there was no secondary fever.

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[1] Jour. Amer. Med. Assoc., Nov. 14, 1903, p. 1207.

[2] München. Med. Klinik., 1903, No. 42.

Guimard and Geley have shown that the local application of sparteine and some other alkaloids (cocaine, solanine, helleborine) has the effect of reducing temperature. The use of sparteine in this manner in a case of confluent small-pox rendered the suppurative process abortive. In a case of confluent small-pox, Baudon obtained a satisfactory result by covering three times a day the face, limbs, and chest with a pomade of one part of salicylic acid to twenty-five parts of petrolatum. A powder of talc, one part, and salicylic acid, twenty-five parts, was then dusted upon the surface. Lewentaner, of Constantinople, used a paste of three per cent. of phenol or salicylic acid, made up with starch or oil of sweet almonds and held in position by means of a mask.

Ulcerations of the cornea should be touched at once with the solid nitrate-of-silver stick. In variola confluens, and in the more severe cases of variola discreta, when the fever remains high, ice-bags may be applied to the head and chest, or the patient placed in a cold bath. When the fever assumes a typhoid type, and the pulse becomes soft and feeble and the mind dull and wandering, full doses of strychnine and digitalis are to be given every four hours, and from ten to fifteen drops of oleum terebinthinæ once in three hours. Camphor, caffeine, phenol, and carbonate of ammonia will also be found serviceable. Favorable results have been obtained also from the subcutaneous injections of fifteen to twenty minims of ether, repeated two or three times during the course of the day. The diarrhea which sometimes follows can readily be controlled by dilute sulphuric acid and opium. If petechial spots appear on the surface, or hemorrhagic extravasations occur, full doses of chloride of iron and strychnine should be given, in alternation with the rectified oil of turpentine every two hours. Alcohol is indispensable in the treatment of all grave cases. If symptoms of pneumonia, pleurisy, or pericarditis appear, a blister should be placed over the affected region, and stimulants freely administered. Gastric and intestinal hemorrhages can be checked by Monsel's solution, given as required, in from five- to ten-drop doses, well diluted. Variola maligna usually defies all medication, but occasionally recovery has been effected. The treatment of this variety should begin with free purgation, after which dilute sulphuric acid, strychnine, camphor, phenol, and oleum terebinthinæ rectificatum are indicated in appropriate doses. Dr. H. Russell, of Superior, Wis., has reported a case in which recovery followed the administration of tincture of iodine, every three hours. Dr. N. S. Davis,[1] of Chicago, has obtained good results in some desperate cases from a combination of phenol and the thiosulphate of sodium, as in the following formula:

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| ℞ Phenolis liquef. .................... | gr. x. | 0.60 |
| Sodii thiosulphatis .................. | ʒvj. | 24. |
| Aquæ menth. pip. ................... | f℥iv. | 128. |

M. Sig.: One teaspoonful in water every one or two hours.

Cases of varioloid do not require much medicine. The administration of a laxative, and a diaphoretic mixture during the initial stage, such as the liquor ammonii acetatis, or a little spirit of nitrous ether, and a chalybeate tonic after the disease is well developed, will usually be sufficient.

Those afflicted with variola should be rigidly isolated, and no one permitted to come near them who is not protected by vaccination or by a previous attack of the disease. The discharges from the patient should be disinfected with common salt, phenol, formaldehyde gas, sulphate of iron, or mercuric bichloride. All clothing and articles used are to be disinfected or destroyed. The room should be thoroughly fumigated with chlorine, iodine, or sulphurous-acid gas, after the patient has been removed from it. The scabs should be carefully collected and burned.

**Prognosis.**—The prognosis of variola is largely influenced by the age of the patient and the extent of the eruption. The greatest fatality occurs, as a rule, in young children and in very old people. Few who are attacked before the sixth, or after the sixtieth year recover. Young adults are more likely to recover. The prognosis is favorable in all uncomplicated cases of variola discreta. It is also good in cases of variola confluens in which only a few large patches are present; but when the tendency to coalesce becomes general, the result is doubtful. It has been estimated that, while the mortality in variola discreta varies from three to five per cent., in variola confluens it exceeds fifty per cent. Variola maligna has a fatal tendency. Varioloid is a benign affection, rarely ending in death.

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[1] Lectures on the Principles and Practice of Medicine. By N. S. Davis, A.M., M.D., LL.D., Chicago, 1884.

## VARICELLA.

SYNONYM.—Chicken-pox.

Varicella is a mild, contagious, febrile affection, characterized by the development of a vesicular eruption on the general surface of the body. It was formerly considered to be identical with varioloid; but is now known to have a different cause. It is not protective against small-pox. Its specific cause has not yet been identified.

**Symptoms.**—Varicella is a disease of infancy and early childhood, seldom seen after the tenth year. The incubation period varies from eight to seventeen days. The chief symptom, and that which usually first attracts attention, is the appearance of a vesicular rash after a premonitory fever of twenty-four or thirty-six hours' duration. The fever rarely rises above 101°, and in some cases is so light as to escape notice altogether. The pulse is usually increased in frequency, and there may be some headache and restlessness. The vesicles appear first on the chest and abdomen, and then rapidly extend to the extremities. In some cases they may be observed on the forehead, scalp, and neck, and on the conjunctiva and the roof of the mouth, but they seldom ever appear upon the lower part of the face. They are circular in shape, and vary in size from a pin's head to a large pea. The first step in their formation consists of the appearance of a number of rose-colored spots, on which vesicles develop after a few hours. They contain a clear, serous or yellowish fluid, neutral or alkaline in reaction. They are all out upon the surface and attain their full size on the second day. On the following one they begin to maturate or dry up, forming small brown or yellowish crusts, which drop off in two or three days. A small cicatrix is left at the site of each, but, as the corium is not involved, it usually disappears after a time. The fever subsides when maturation commences, and the whole course of the disease is terminated within a week. In rare instances an erythematous or papular rash has preceded the characteristic eruption.

**Diagnosis.**—Varicella might be confounded with varioloid or with measles. In varioloid, however, the eruption is first papular, then vesicular, then pustular. It appears on the third day of the primary fever, and may be limited to the face, where it is usually first observed. In measles, the eruption is seen first on the face on the fourth day of a severe fever, but it is coarsely papular in character, and accompanied by marked coryza and bronchitis. In varicella, on the other hand, it appears on the first or second day of a mild fever; rarely upon the face, and is never papular or pustular.

**Pathology.**—The rose-colored spots which precede the development of the vesicles are due to active congestion of the capillary vessels of isolated cutaneous papillæ. As the morbid process continues, an exudation of serum occurs which, penetrating between the layers of the epidermis, separates them, and results in the formation of a vesicle.

**Etiology.**—Varicella may occur sporadically or as an epidemic. It is propagated by contagion, and is evidently due to a specific poison, but neither the nature of the poison nor the exact method of its communication is known. Efforts to discover a specific micro-organism have not as yet been attended by decided success. Tenholdt discovered a micrococcus in the contents of the vesicles, and in thirty cases Pfeiffer found a germ which went through successive stages of ameboid, cyst, and spore formation. It was impossible to cultivate this parasite upon any soil. But these observations are far from conclusive.

**Treatment.**—If the fever and headache become severe, from one-eighth to one-fourth of a minim of the tincture of aconite, or half a minim of the tincture of gelsemium, may be given in syrup and water every three hours, and a saline laxative administered.

The majority of cases, however, require no other treatment than rest and a mild diet. The patient should be kept indoors for a few days, and restricted to a diet of bread and milk and fruit.

**Prognosis.**—The prognosis is favorable. Only a few deaths from varicella have ever been recorded, and, being debilitated children, they were probably dying from inanition when the disease appeared. In rare instances hemorrhage, catarrhal pneumonia, or nephritis has occurred as a complication of chicken-pox. The importance of repeated examination of the urine in cases of varicella depends upon the occasional occurrence of fatal nephritis as a complication. Dr. Walter T. Roberts, of Louisville, Ky., has chronicled the case of a previously healthy infant of nine months in whom, on the fourth day of an attack of varicella, a dermatitis gangrenosa began to develop and terminated life upon the sixth day. The dermatitis was peculiar in being unilateral.[1] Under the name of varicella gangrenosa Mr. Jonathan Hutchinson described cases in which ulceration took place in the varicella vesicles. Cases have also been described, in this country, by Woodward, Büchler, Spivak and Griffith. The case of Griffith was complicated by diphtheria and measles. This gangrene is most frequently seen about the genitals and the face, and generally causes death.

The late Professor Demme observed a case in which the eruption was preceded by high temperature and a convulsive seizure, and another in which there were severe blood-stained diarrhœa and fever, rapidly disappearing after the outbreak of the rash. In two cases the eruptive period was unusually prolonged, with successive crops of pocks, accompanied by a scarlatiniform erythema and followed by nephritis. Mr. Nisbet, of Townsville, Queensland, records a fatal case of uncomplicated chicken-pox occurring in a previously healthy infant. The eruption covered the entire body, and numerous spots, changing to irritable ulcers, appeared upon the tongue and mucous membrane of the mouth. Dr. John Thomson, of Edinburgh, describes a case of hemorrhagic varicella with pemphigoid bullæ ending in death. Hemorrhages occurred in both vesicles and bullæ. Dr. Boucheron, in an inaugural thesis upon the respiratory complications of varicella, mentions bronchitis, broncho-pneumonia, pleuro-pneumonia, and purulent pleurisy. In one case of double broncho-pneumonia which ended in death, he found near and upon the vocal cords small vesico-pustules analogous to those upon the skin. Dr. Coulon has reported two cases in which chicken-pox coexisted with scarlet fever. Chicken-pox and measles also occasionally coexist in the same individual.

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[1] Medical Progress, February, 1891.

Paralysis is a rare sequel of varicella. Gay reported a case of peripheral neuritis following varicella, and a case of paraplegia of spinal origin was reported by Marfan.

Varicella occasionally attacks the larynx, this localization occurring with the beginning of the cutaneous eruption or a little later, giving rise to laryngitis with stenosis or spasm of the glottis. The spasm may prove fatal or death may be caused by a secondary broncho-pneumonia. Varicellar laryngitis is characterized anatomically by small circular ulcers, few in number, situated by preference upon the lower vocal cords.

Otitis media, noma and orchitis have been reported as following chicken-pox. In addition to local complications, varicella occurring as a primary affection may, by lowering the resisting powers of the subject, invite the development of other infections; thus measles, rubella, diphtheria, scarlet fever and whooping cough have each been found in connection with this disease.

## VACCINIA.

SYNONYM.—Cow-pox.

Vaccinia is a specific, contagious, eruptive disease, attacking cattle, and which, when transmitted to man by inoculation, so modifies the entire system as to render it insusceptible for a long time to the poison of variola. Confusion and controversy have arisen as to the nature, relationship, or identity of the affections loosely denominated pox, and which occur in several of the domestic animals. An able summary of this vexed subject has been given by Mr. Fleming in a paper upon "Variola in Animals and Men." Sheep-pox and goat-pox differ from each other and from cow-pox, horse-pox, and variola. Both cow-pox and horse-pox, or "grease," when inoculated into the human subject prevent the development of variola. Professor Peuch, of Toulon, has demonstrated that vaccine derived from the horse and passed through the calf to the child is much more powerful than a variola which has passed for a long time between children and calves. Ordinarily human lymph passing from one calf to another loses its power in the third or fourth generation, while the energy of horse-pox vaccine seems undiminished at the eleventh generation.

Upon this point, however, the experience of Dr. Leonhard Voigt, of Hamburg, differs, as he found that variolous lymph was still active after being transmitted through twenty-one calves, and used it successfully for public vaccination. When it has passed through only one or two removes from the human being (i. e., through one or two animals inoculated with variolous lymph), it may prove undesirably energetic. King, Shordt, and Hime made use of the seventh and Fisher even the third remove. The process of inoculation is termed vaccination.

All children should be vaccinated during the first six months of infantile life, and revaccination performed about the eighth year of age or when they commence school life and then again at puberty. If the vaccination "takes" properly at each of these periods, further repetition will be unnecessary. Statistics show that while varioloid may occur in seven per cent. of those who have been vaccinated once, it is rarely seen in those who have been vaccinated twice, and never observed in those who have undergone it three times. It is advisable to vaccinate an unprotected person immediately after exposure to the contagion of small-pox. Even if the operation is not performed until symptoms of variola are manifested, the course of the disease is favorably influenced; the pustules often dry up without secondary fever.

Either bovine or humanized virus may be employed, but, in using the later, care must be taken to select only that which has been obtained from healthy persons, uncontaminated by syphilis or scrofula. In some countries vaccination is practiced by taking the lymph directly from the lesion on the calf and transferring it to the arm. In this country, it is generally performed indirectly by dipping small pieces of bone, quill or glass in an emulsion of the ground-up vaccine vesicle and allowing it to dry, in a place free from dust. This vaccine point is then used to deposit the vaccine upon the scarified surface as described below. Vaccine lymph may be transferred from the arm of a vaccinated person after the vesicle is fully formed, to the arm of another person by the point of a lancet. This is known as "arm-to-arm" vaccination. A portion of the crust, or scab, from a typical vesicle may also be used for vaccinating, but this has fallen into disuse because of the danger of transmitting disease, notably syphilis.

In performing the operation, almost any part of the integument may be used. This area should be carefully cleansed with soap and water followed by ether or alcohol. The arm or leg is generally selected and scarified longitudinally and transversely over about a square half-inch of the surface. The scarification should be made lightly, so that it will merely bring the blood to the surface, and not cause it to ooze out in drops. If the vaccine matter is in a liquid condition, it can then be placed on the surface. If quills or points are employed, they should be dipped in water and then rubbed freely into the selected spot. If a scab is used, it may be dissolved in a few drops of water or glycerin, and then applied on the wounded spot.

Mr. W. R. Buckell,[1] of Cheltenham, England, has narrated the history of a peculiar case in which a vaccine vesicle developed upon the tongue. A mother had run a fish-bone into her tongue two days before her baby was vaccinated. The tongue remained sore for some time. One week after vaccination the mother kissed the babe upon the arm at the site of vaccination. Six days later her tongue began to swell.

In order to avoid the possibility of septic accidents, it is well before operating to have the arm thoroughly cleansed and to hold the blade of the lancet, if one be used, for a moment in a flame. More elaborate antiseptic precautions have been suggested, but are likely to destroy the virus and thus defeat the very object of the operation. Dr. Alfred Leach has followed an antiseptic method of vaccination for six years, during which period he had but one case of inflamed arm. His custom is to wash instruments, lymph tube, and patient's arm in a disinfecting solution, and to make in four places small scarifications and valvular punctures with a Graefe's cataract knife charged with lymph. Bismuth is dusted upon the wounds when perfectly dry.

The rapid destruction of animal lymph in hot countries has been a serious difficulty. In India the lymph seldom retains its power for more than three days. It can be preserved in boro-glycerid for about fifteen days. Surgeon-Major W. G. King,[2] of Madras, has succeeded in producing a vaccine paste which remains efficacious for about a month. The paste consists of the pulp of the vaccine vesicle mixed with pure lanolin in the proportion of one of the former to four of the latter material.

Immunity may also be produced by subcutaneous inoculation of vaccine virus, being developed gradually and not completely until the eighth day.

**Symptoms.**—If the vaccination has been properly performed, and pure vaccine matter employed, a hard, red papule will appear at the site of inoculation on the third or fourth day. This papule will enlarge and become vesicular on the fifth or sixth. The vesicle is umbilicated, is surrounded by a red areola, which increases in size. On the eighth or ninth day it is converted into a pustule, which reaches its full development on the tenth or eleventh. The conversion of the vesicle into the pustule occurs rather suddenly. The areola then begins to fade, a dark-brown spot appears in the centre, the contents dry up, and a dark-brown or mahogany-colored scab is formed by the fourteenth or sixteenth day. Cicatrization continues beneath until about the twenty-first or twenty-third. The scab then falls off, leaving a circular, depressed, reddish cicatrix, which usually remains through life, but gradually becomes whiter than the adjoining skin.

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[1] British Medical Journal, June 22, 1889.

[2] "Concise Report on Results obtained in the Madras Presidency with Lanoline-vaccine during the Experimental Issue from November, 1890, to July 1891." By Surgeon-Major W. G. King, M.B., D.P.H., in The Indian Medical Record, December 1, 1891.

The constitutional symptoms accompanying true vaccination consist of slight fever, headache, and restlessness during the evolution of the eruption. Occasionally the fever is quite high and a brief delirium is produced. In some cases the axillary glands become swollen and painful. In other cases a diffused scarlatiniform, papular, or papulo-vesicular eruption may appear over the whole body. These, however, are only of brief duration, and usually disappear within a few days.

A case of generalized vaccinia has been observed by Gaucher. A child was vaccinated with calf-lymph. Eight days later three good vaccine pustules were present upon each arm and the fever became severe. On the eleventh day a general eruption was scattered over nearly all the body. Some of the pustules advanced to umbilication while the development of others was arrested. The general condition grew worse, and the child died with symptoms of asphyxia. The lungs were found congested, the spleen enlarged, kidneys softened, and the liver in the early stage of fatty degeneration. Frölich relates the case of a child who was attacked by nephritis eleven days after vaccination with calf lymph.

Vaccination with impure matter may entail the most serious consequences. The eruption produced by improper virus does not pursue the typical course of true vaccination. A number of different forms of micro-organisms have been detected, including the ordinary pyogenic micrococci and staphylococci; diphtheria, colon, tetanus and tubercle bacilli; the actinomyces bovis, etc. Since the production of vaccine has been supervised by the government and proper precautions observed, the danger from contaminated vaccine is very much less than before. When there is a mixed infection the areola appears early, is large and irregular. The papules appear earlier, also, and change rapidly into vesicles and pustules, which are not umbilicated, and either dry up early, forming a thick, black scab, or extend into large suppurating ulcers, which spread widely and deeply, and manifest no disposition to heal. Erysipelas not infrequently occurs as a complication. Boils and abscesses may also form, and run a tedious and painful course.

The subject of vaccination eruptions was discussed at the meeting of the British Medical Association in 1890. Mr. Malcolm Morris divided these rashes into two groups, one being due to pure vaccine inoculation, and a second caused by mixed infection—that is, by vaccine together with an additional virus. Certain rashes of the first class appear within the first three days before the development of the vesicles, and are probably originated by reflex nervous influences from the part operated upon. They assume the forms of urticaria, erythema multiforme, vesicular, and bullous eruptions. Those which follow the evolution of vesicles and are due to the absorption of virus may take the form of roseola and resemble measles; of erythema, resembling scarlatina, or of purpura. Roseola and erythema generally appear upon the eighth or tenth day after vaccination, spread from the vesicles, and are accompanied by slight constitutional symptoms. Sequelæ of vaccination are eczema and urticaria; psoriasis and pemphigus have occasionally occurred. Eruptions due to mixed infection introduced at the time of vaccination are impetigo contagiosa, dermatitis, or erythema. Affections due to introduction through the wound subsequent to vaccination are erysipelas, cellulitis, boils, gangrene, and, in very rare instances, pyemia. An edipemic of tetanus following vaccination has been observed, owing to carelessness in preparing the vaccine, or uncleanliness in the patient which caused infection of the wound. Hutchinson has reported a case in which a general vaccinia became gangrenous. Some individuals appear to be insusceptible to the action of vaccination. It is probable they are also at that time insusceptible to the poison of variola, but, as that peculiarity of the constitution may be modified by time or other circumstances, repeated efforts should be made to induce the mild disease in them. I recollect several cases in which six or seven vaccinations failed, but a later one proved successful. In such refractory individuals arm-to-arm vaccination may be successful, as the virus becomes more active after the first or second remove from the calf, although later it decreases in activity (after the ninth or tenth remove). When former attempts have failed, vaccination should be repeated at each new epidemic.

The cutaneous symptoms of other eruptive fevers may be briefly described as follows:

Typhoid Fever.—In typhoid fever the eruption appears about the seventh day, but may be delayed until the tenth or twelfth. It consists of a few small pale-red or rose-colored spots, not at all or only slightly elevated, circular or oval, which disappear upon pressure, returning as soon as it is removed. These spots are usually developed only on the chest and abdomen, but they may be observed upon the back. They vary in number from one to twenty-five or more. Occasionally the eruption is more disseminated and very abundant. Spots may appear upon the extremities as well as upon the trunk. Murchison mentions one case in which they appeared upon the face. Each remains visible for three or four days. It then fades, and another is developed near the site of the first. Successive spots appear and disappear in this manner for a week or more. They then disappear without either pigmentation or desquamation, but return if a relapse occurs. Sudamina sometimes occur in the later stages of typhoid fever, but are not characteristic of the disease. These sudamina are in some cases followed by desquamation; in rare instances also small blue spots, *taches bleuâtres*, have been observed. They are not peculiar to typhoid fever, generally precede the rose-colored eruption, are not elevated, and do not disappear on pressure. They may be identical with the blue spots produced upon the skin by lice.

Accidental rashes occasionally appear and may embarrass the diagnosis. An eruption similar to urticaria, or a scarlatiniform erythema, has been observed. The erythema generally occurs at the end of the first or in the third week, and may be followed by profuse desquamation. An epidemic of infectious erythema in the course of typhoid fever has been described. Most cases developed during the third week. The access of this complication suddenly increased the prostration of the patient. The urine is scanty and contains much albumin. If the erythema be preceded by vomiting, change in the features, reduction of temperature, and retardation of pulse, the termination is generally fatal. In the absence of these symptoms a very slow recovery took place. The average duration of an attack was two and a half days. Herpes, purpura hemorrhagica, papular eczema, and erysipelas have been witnessed during the disease, and *lineæ atrophicæ,* similar to those of pregnancy, have been observed as a sequel, in males as well as females. A mottled petechial eruption and one resembling that of measles are sometimes witnessed.

TYPHUS FEVER.—In typhus fever the eruption appears from the fifth to the seventh day. It consists of numerous coarse, dark-red spots or papules, elevated above the surrounding healthy skin, and are not influenced by pressure. They are abundantly developed upon the trunk and the extremities, but never appear upon the face. In some cases of typhus the spots turn purple or become surrounded by black petechiæ. Dark or purple linear and irregular hemorrhagic extravasations may also occur.

The eruption attains its maximum development in twenty-four or forty-eight hours, and remains permanent until the fourteenth or fifteenth day, when it slowly fades as convalescence begins. If the disease ends fatally before that time, the eruption remains after death.

CEREBRO-SPINAL FEVER.—In cerebro-spinal fever the eruption usually appears, if at all, within the first twenty-four hours, but may not develop until the third day. It consists of purpurous or cherry-colored elevated spots, which do not disappear upon pressure. They are found upon all portions of the body except the face, and vary in number with the severity of the attack. They disappear with convalescence, but remain on th face in cases which result fatally.

Rocky Mountain Spotted Fever.—This is an infection pr by bites of the wood-tick or dermacentor occidentalis and appears limited geographically to a certain section of this country from w it derives its name. The area does not extend beyond the confi longitudes 107° and 120° and of latitudes 40° and 47°. This in eastern Oregon, Idaho, Wyoming, Utah, the northern extremity of N and the northwestern part of Montana. It prevails in the spring and summer months, between March 17th and July 20th, as stated by Spencer,[1] of Huntingdon, Oregon. It is more virulent in some loc than in others. As a rule, it is contracted only by people sojourni the open, whose occupation exposes them to the bites of wood-tick 1902, Wilson and Chowning discovered the parasites in the blood as intracorpuscular bodies showing ameboid movements. G. A. Pog Ontario, regards the rabbit as the most likely host of the wood-tick d the months of its apparent disappearance.

The disease is ushered in by a chill, preceded by a short peri *malaise.* On the surface of the body one or more tick-bite lesion usually be found. On the day after the chill, there is pyrexia (10 103° F.). Skin is dry and cyanotic, conjunctivæ injected and the to covered with a thick white coat. Nausea and vomiting may occur, bowels are apt to be constipated. Urine scanty and highly colored from two to five days after the chill, a bright red macular eruption m its appearance, first on the wrists, ankles and forehead and then sp over the body. Generally it takes two days for the rash to become developed. There is an alleviation of the bodily aches and pains with appearance of the rash; but the fever continues and may increase un reaches its maximum early in the second week (104° to 107°). Sl morning remissions and evening exacerbations are the rule. In the ond week the fever gradually begins to diminish requiring another w or ten days to regain the normal. It may be a little subnormal for a days or a week (98°). In the course of the disease, the maculæ bec larger and darker colored until in the third week they are purple. In s severe cases they may coalesce into blotches, causing a mottled surf During convalescence the color gradually fades, but it may be week months before they are indistinguishable. General desquamation, over entire body, takes place during convalescence.

Chowning refers recently to a statement in the "Journal of Infect Diseases," Vol. I, No. 1, page 44, to the effect that in the blood in se teen cases of this disease no bacteria were found. A study of the mat from these cases[1], however, shows that organisms apparently of plant life are present in eight of them. He describes the technic of examination and the morphology of the clumps, and gives a preliminary note on beerwort as a culture medium.

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[1] Medical Sentinel, Nov., 1907.

DIPHTHERITIC SPOTS.—Severe cases of diphtheria are sometimes complicated by an eruption resembling that of cerebro-spinal fever. It may appear at any time after the third day. It consists of dark-red or cherry-colored spots, which are not influenced by pressure. They are not elevated, however, and are usually few in number and limited to the face and chest. Diphtheria may also be accompanied by an erythematous rash similar to that of scarlatina. It is not as vivid, however, as the scarlatina efflorescence, and never extends beyond the neck and breast.

DIPHTHERIA OF THE SKIN.—Gunther[2] reports two cases of rare localities for diphtheritic infection. (1) The mucosa of ileum, sigmoid flexure and rectum, and (2) a primitive cutaneous diphtheria of the abdomen with subcutaneous phlegmon, superficial and progressive. The bacilli were demonstrated bacteriologically and microscopically. Slater reported[3] an interesting case of diphtheria in a girl thirteen years of age in which two patches involved the inside of each labium. A bacteriological examination confirmed the diagnosis.

INFLUENZA.—Although influenza is attended by no characteristic eruption, yet in the epidemics from 1889 to 1892 rashes were seen in quite a number of cases by different observers. Sometimes the eruption assumed a papular form and again appeared like that of scarlatina and was followed by desquamation. Occasionally a purpuric lesion was encountered. Among other cutaneous lesions manifested during its course were urticaria, erythema, erythema nodosum, roseola, erysipelatoid dermatitis, and a morbilliform eruption. A few cases of herpes zoster were also reported, some complicating, others following the influenza. Dr. Mapother observed that the great debility due to influenza converted, when the patients were eczematous, a serous into a pustular discharge. It also predisposed to acute attacks of pustular eczema. Shelly notes the frequent occurrence in influenza of small sago-like vesicles upon the soft and sometimes the hard palate.

## ERYSIPELAS.

SYNONYMS.—The Rose—St. Anthony's Fire.

Erysipelas is an acute, specific, eruptive, febrile disease, characterized by an intense inflammation of a limited area of the skin or mucous membranes, accompanied by various constitutional phenomena, and terminating in desquamation of the affected portion of the epidermis. It is contagious in character. It is especially communicable to wounds and cases of surgical operation, and also to pregnant women.

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[1] "Rocky Mountain Spotted Fever," Wm. M. Chowning, Minneapolis, Northwestern Lancet, February 1, 1908.

[2] Centralblatt für Bakteriologie und Parasiten Kunde, 1907.

[3] London Lancet, January 4, 1908.

**Symptoms.**—Erysipelas usually begins abruptly with a slight chill, or an attack of nausea and vomiting. This is followed in a few hours by a high fever, with more or less headache and pain in the back and limbs. The tongue becomes coated with a thick white or yellowish fur, the skin is dry and hot, the urine is scanty and high-colored, and the bowels are torpid. The pulse is rapid and forcible, varying from 100 to 130. The temperature ranges from 102° to 104°. There is intense thirst, but no desire for food. The eruption usually appears within the first twenty-four or thirty-six hours. It consists of a circumscribed deep-red or rose-colored spot which generally appears first upon the nose, cheek, ear, or scalp. It may, however, develop upon any portion of the cutaneous or mucous surfaces. In some cases it is first observed upon the fauces, in others the vulva. Erysipelas of the larynx is generally an extension from the face or nose, though it is sometimes witnessed in connection with or consequent upon erysipelas seated in some distant part. In rare instances it may occur as a primary manifestation. A case of primary erysipelatous broncho-pneumonia has been reported by Dr. M. Mosny. M. Papillon has also reported a case of erysipelatous pleuro-pneumonia without external erysipelas, and M. Cuffer has published the history of a patient in whom symptoms of pulmonary inflammation were present for four days before a characteristic rash appeared upon the face.

The ear may be involved in erysipelas. The disease may extend from the face, the nose, or naso-lachrymal canal.

The color disappears on pressure, but returns as soon as the pressure is removed. It is preceded or accompanied by a sensation of heat and tension, and more or less tingling or pain. There is intense itching, the surface is glossy and swollen. The eruption and tumefaction rapidly spread in all directions. If the face or scalp be involved, the features become distorted to such an extent that they can scarcely be recognized. The lips are stiff and tumid, the nose, cheeks, and scalp are infiltrated and swollen, and the eyelids can not be separated. In severe cases large vesicles or blisters filled with serum are developed. In grave cases the vesicles become black or purple from an extravasation of blood. The eruption reaches its maximum development in about three days. It then ceases to spread, and gradually loses its vivid-red appearance, assuming a yellowish hue. The swelling also subsides, the vesicles shrivel up, and the febrile and other symptoms disappear. Convalescence is established about the eighth or ninth day. Moderate desquamation of the epidermis then takes place, and in some cases the hair falls out, but a new growth is soon developed. Various complications are observed during an attack of erysipelas. The cervical and axillary glands are frequently enlarged.

Delirium may be caused by the height of the temperature, or from embolism of the cerebral capillaries. The urine may become loaded with albumin, or it may be completely suppressed, and uremic poisoning ensue. Endocarditis, pneumonia, and pleurisy have also been noticed.

Suppurative arthritis may complicate erysipelas. Facial erysipelas is occasionally followed by blindness. Dr. E. F. Snydaker, of Chicago, reports a case in which vision began to fail soon after recovery, and three months later secondary optic atrophy was present in both eyes. Various affections of the eyeball and lids have been witnessed as the result of erysipelas. In the phlegmonous variety, the areolar tissue is extensively infiltrated; suppuration and much destruction occur. In gangrenous erysipelas the surface turns black, large sloughs are formed, and the patient dies from pyemia. In erysipelas of the fauces the tongue, pharynx, and larynx are swollen, and death may suddenly ensue from edema of the air-passages. Erysipelas ambulans is a semi-chronic variety in which the eruption recurs from time to time, but always upon a different region of the body from that previously attacked. Relapses often occur.

**Diagnosis.**—The diagnosis is easy. The only affections which resemble it are erythema and eczema. In erythema there is neither fever nor pain, and little or no swelling. The eruption usually appears upon the trunk or extremities, and consists of large spots or blotches, which are not circumscribed, but fade imperceptibly into the normal skin. In eczema the surface is fiery red and burning, covered with minute vesicles or fine scales; but there are no constitutional symptoms. Erysipelas of the fauces or pharynx might be mistaken for an ordinary irritative inflammation. The diagnosis can be made by contrasting the dusky-red color, the rapid development, the migratory tendency, and the constitutional symptoms of erysipelas, with the bright-redness, the restricted development, and the comparatively mild nature of ordinary inflammations of the pharyngeal or buccal cavity.

**Pathology.**—The first stage consists of active hyperemia of the blood-vessels of the affected surface. Exudation of serum and migration of white corpuscles then occur. All the layers of the skin become edematous and infiltrated with serum and leucocytes. Vesicles are formed by an accumulation of fluid between the layers of the epidermis and between the epidermis and the corium. In severe cases rupture of isolated capillaries may follow. The blood is thinner and darker than normal. The heart, kidneys, liver, and spleen undergo more or less granular degeneration. Embolism of the cerebral vessels sometimes happens.

**Etiology.**—Erysipelas is caused by a virulent form of streptococcus, the suppurating lesions often being due to mixed infections. The disease may develop at any age, but is most frequently met with from the twentieth to the fiftieth year. It is not limited to any season, but is most prevalent during the spring and autumn. According to the observations of Professor

J. M. Anders it prevails above all in the spring. One attack predisposes to others. Some individuals suffer from frequent recurrent attacks. In women the disease may recur at menstrual periods. The same phenomenon has been witnessed in connection with uterine fibroids. Erysipelas is propagated by contact as well as atmospheric diffusion. It usually prevails in epidemics of varying extent and severity, but isolated cases are not uncommon. Erysipelas may follow an injury produced by a blow, or an exposure to cold or damp weather, especially when connected with alcoholic indulgence. It may occur in consequence of wounds made in surgical operations. Women, after confinement, seem to have a greatly increased liability to infection with the streptococcus, and pus-forming organisms.

Facial erysipelas frequently depends upon intra-nasal lesions, such as extreme turgescence of the mucous membrane or occlusion of the nares by enlarged turbinated bones, especially by necrosis of the ethmoid. Of seventy-four cases of facial erysipelas, Lehrnbecher found, in forty-seven, some chronic inflammation of the nasal, mucous membrane with cracks, crusts, and ulcers.

A specific microbe of erysipelas which is a form of streptococcus: the *micrococcus erysipelatis*, has been isolated and cultivated. This organism known as the streptococcus of Fehleisen develops well at 70° F., flourishes abundantly at 95° to 100°, ceases to be prolific at 107°, and is destroyed above 120°. It survives as low a temperature as 20° F. An interesting communication made to the Biological Society of Paris by M. Leroy, of Lillie, may throw light upon the obscure origin of certain cases of erysipelas. In December, 1887, M. Leroy prepared a gelatin tube with a pure culture of this organism. As usual, it did not thrive well, and at the end of four or five weeks appeared to be entirely dried up. But to his surprise, in the latter part of January, 1889—that is to say, after an interval of more than a year—the microbe which had been considered dead resumed growth and gave rise to active new colonies. The tube had remained during the year at a distance from the stove, exposed only to the ordinary temperature of the room. Animals inoculated with the revived culture demonstrated its activity and virulence.[1]

According to the investigations of Fehleisen, the streptococci erysipelatis, through some lesion, enter the skin and penetrate its lymph-spaces, and vessels, where they develop rapidly until the vessels are more or less occluded. An active hyperemia is excited, together with an exudation of plastic, cellular material. By the time the inflammatory action has reached its height the colonies of micro-organisms have disappeared. Infection extends by way of the lymphatic vessels. As a rule these micro-organisms do not usually appear in the larger blood-vessels, and those which do so are speedily destroyed. Yet the infection has been carried by the blood of puerperal women to the uterus and to the fetus. These germs are capable of development outside the human organism, under favorable circumstances, and are often very widely disseminated, which fact serves to explain the occurrence of epidemics of facial erysipelas and the increased number of cases at certain seasons of the year. Similar organisms have been detected by v. Eiselsberg and Emmerich in the air of a dissecting-room. They are readily disseminated by particles of desquamated skin, to which they adhere. When brought into contact with favorable organic media, they develop and are subsequently dispersed through the atmosphere. It is probable that they are frequently present in decomposing organic matter. This view is supported by the fact that decomposing secretions of wounds, especially when mixed with blood, cause erysipelas.[1]

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[1] Medical Bulletin, May, 1890, p. 170.

The streptococcus discovered by Fehleisen and believed to be the exciting cause of erysipelas bears a marked resemblance to the streptococcus pyogenes. On the grounds of the different results of inoculation experiments, however, Fehleisen is not inclined to believe that the erysipelas germ is a pyogenic microbe. Pure erysipelas can not, according to this conception, be attended by suppuration. Phlegmonous erysipelas is regarded as due to mixed or secondary infection. From the evidence furnished by inoculation it appears that the stage of incubation is of three or four days' duration. The erysipelas microbe has been detected by MM. Verneuil and Clado in products taken from cases of lymphangitis. These observers, therefore, hold that erysipelas and lymphangitis are simply different forms of the same disease. Cultures derived from patients suffering from acute lymphangitis produced erysipelas in rabbits.

My colleague, Professor Ernest Laplace, as a result of a number of culture experiments has shown that the virulence of the streptococcus of erysipelas is influenced by attendant conditions. The activity of the infection is intensified by media of an alkaline reaction, and is diminished by media of an acid reaction. His experiments appear to thoroughly disprove the specificity of the micrococcus erysipelatis since by cultivating it in an acid medium, the streptococcus changed to an apparently typical staphylococcus. In other words, it is transformed into a saprophytic organism, which is indistinguishable from forms found in decomposing animal and vegetable structures, and this would explain their occasional power of infection already alluded to.

**Treatment.**—The most effective treatment of idiopathic erysipelas in young and robust adults consist in the hypodermic administration of from one-sixth to one-fourth of a grain (0.01 to 0.015 gm.) of pilocarpine hydrochloride which produces profuse diaphoresis, during which pulse and temperature fall to almost normal, the eruption becomes pale, tumefaction diminishes and the further progress of the disease is checked or mitigated. This method is of striking benefit when erysipelas has attacked the larynx. In cases where hypodermic injections are not deemed advisable, pilocarpine, or jaborandi, may be given by the mouth. Neither of these remedies should be ordered, however, to anemic or debilitated subjects, as serious cardiac depression might result. In such cases some other plan of treatment is preferable. The administration four times daily of a pill containing three grains (0.18 gm.) of the sulphate of quinine and one-twelfth of a grain (0.005 gm.) of the extract of belladonna has been recommended and is often followed by good result. A combination of aconite, ♏ v-vii, and phenol hydrate or carbolic acid, ♏ ss., every four hours, has also produced excellent results, but is not suitable for asthenic cases. M. Tison speaks highly of the use of aconitine in facial erysipelas. He administers every sixth hour $\frac{1}{250}$ grain (0.00024 gm.) of Duquesnel's crystallized aconitine, and has seldom found it necessary to continue the treatment beyond the third day. Usually it could be discontinued within forty-eight hours. Some patients require to be stimulated from the beginning, and will not tolerate the employment of aconite, pilocarpine, or any other vascular depressant. The pulse should be the guide, and aconite or belladonna employed in accordance with its indications. These agents, however, have no direct influence on the course of the characteristic manifestations of the disease, and can only be regarded as adjuvants. The tincture of iron acts equally well in the sthenic and asthenic forms. It should be taken in large doses, as much has been given as one-half to one or two drachms (2 to 8 gm.) every three hours, until convalescence is established. If urine be scanty, the iron can be given in the form of Basham's mixture. The bowels should be freely opened by a calomel or calomel-and-jalap-purge, followed by a saline. Rest in bed in a dark room is essential. According to a fragment published since his death, camphor was the favorite remedy of Pirogoff. He gave it in half-grain (0.03 gm.) doses six times during the first day, afterward increasing one grain (0.06 gm.). When camphor failed he administered calomel or tartar emetic. The former was preferred when the tongue was heavily coated, and was given in the dose of six grains (0.36 gm.) once a day. The tartar emetic was employed when the patient had eaten too heartily, twenty-four hours previously to the development of erysipelas. Various antiseptic substances have been administered internally with more or less success. Among these may be mentioned creosote, permanganate of potassium, and betanaphthol, the first and last being the most efficient. Rhus toxicodendron has been found of avail by Phillips. In severe cases characterized by high fever, bounding pulse, and throbbing carotids, ice-bags should be applied to the head and face, and full doses of aconite or veratrum viride administered every hour until relief is obtained. If there be fierce delirium and high fever, the same measures may be resorted to; but if the delirium should be low and muttering, and evidently due to suppression of urine, one or two drops of croton oil or an eighth of a grain (0.008 gm.) of elaterium should be placed on the tongue; or sufficient pilocarpine injected hypodermically to produce profuse diaphoresis. In an unusually severe case which spread from the face to the trunk and upper extremities, Dr. Favre obtained a strikingly good result from the use of antipyrin. If symptoms of embolism supervene, I advise the free use of carbonate of ammonium and the alkalies. In phlegmonous erysipelas, quinine, iron, belladonna, and stimulants are the remedies to be relied upon. In the gangrenous variety, camphor, strychnine, the mineral acids, and oil of turpentine may be resorted to. In malarial erysipelas, large doses of quinine are necessary. Marmorek claimed good results from the injection of antistreptococcus serum, or antitoxin of streptococcus infection, the dose varying from 10 to 20 c.cm. James C. Ayer has reported[1] a series of 48 cases treated successfully with antistreptococcic serum (20 cc. given in one or two doses), in which the average duration of the disease was reduced to 6.8 days. The mortality was less than ten per cent. (9.9).

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[1] Lehrbuch der Pathologischen Gynäcologie, Vorlesungen für Aerzte und Studirende von Dr. P. Baumgarten, Braunschweig, 1888.

In erysipelas of the larynx the constitutional treatment should be conducted upon the general principles already stated, ice should be applied to the neck, and the patient directed to swallow pieces of cracked ice. Morphine or cocaine may be used locally in order to abate pain. If swallowing is difficult, alimentation by the esophageal tube or by rectal injection may be resorted to; if dyspnea is urgent, scarification of the swollen mucous membrane or tracheotomy may become necessary. If the nasal cavity be the seat of the disease, tampons of corrosive-sublimate cotton should be introduced; and if there is much suppuration the nares should be washed out with a weak solution of the same substance (1:4,000 or 5,000), or the dioxide of hydrogen, combined with alkaline antiseptic solutions.

It has been said that external applications in erysipelas are useless, and, when ordered, are only of the nature of placebos. This is a grievous mistake. The itching and burning demand relief, and if it be not obtained, the patient tears his skin with his fingers, and at times becomes almost frantic. Various preparations have been recommended for external use in erysipelas, but the majority are useless and many are injurious. Tincture of iodine, mercurial ointment, and solutions of nitrate of silver and phenol can be employed, but they are all more or less painful and often inefficient. The ointment of the oleate of bismuth, on the other hand, is an elegant and effective application, which can be depended upon to allay the itching and burning, and lessen the pain and nervous irritability. Dr. Lobit, of Biarritz, recommends for facial erysipelas an application of 10 parts of iodol in 90 parts of collodion. M. Marc Sée is accustomed to use a permanent antiseptic dressing chiefly composed of the subnitrate of bismuth, either as a prophylactic in the case of unhealthy wounds, or as a remedy in actually developed erysipelas. Clarence D. Ussher,[1] of Van, Asia, advises bathing with hot water, as near the boiling point as can be borne, for half an hour, and this to be followed by bichloride solution (1:1,000) for twenty minutes. This is to be repeated from 2 to 4 times, the latter in severe cases. This is completed by applying yellow oxide of mercury ointment (gr. viij to petrolatum one ounce). Pirogoff's method was to cover the diseased surface with slices of bacon rind or lard, covered by a layer of cotton-wool and held in place by a bandage. As a local dressing, he also recommended a piece of linen, cut into a mask, when the face was affected, and thoroughly saturated with camphorated olive-oil. As a local application, M. Tison recommends a solution of camphor in ether. In erysipelas of the trunk and limbs, Dr. A. Rose, of New York, has seen great advantage from immersion of the affected part in a bath of a temperature of 90° to 95°. The inflammation and pain are rapidly relieved and the fever reduced. The ointments of carbonate of lead and boric acid are also valuable. Another useful but not so elegant an application was the earth-dressing of Dr. Addinell Hewson. This dressing consists of a thick paste of clay and water. It relieves the pain and burning almost instantly, lessens the fever and swelling, and in many cases exercises an abortive effect upon the disease. This is now supplanted by the clay and glycerin ointments of the Pharmacopœia. Sir Dyce Duckworth recommends a thick chalk-ointment.

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[1] Medical Record, Aug. 6, 1905.

Dr. George C. Kingsbury advocates the local use of ergotin, in the form of a fifty-per-cent. solution in distilled water, frequently applied with a camel's-hair brush to and around the affected area. A few applications suffice to reduce swelling and relieve pain. Various antiseptics have of late years been widely employed as local applications. Unna considers that ichthyol and resorcin exercise almost specific influence. Concentrated solutions of the latter are capable of producing edema and blebs. It is therefore prudent either to begin with a weak solution and increase the strength to the point of tolerance, or the remedy may be combined with some substance which shall mitigate its action, and among the best of these are oxide-of-zinc ointment and linseed or olive oil. Upon hairy parts, especially the scalp, it is better to use an oil. As a rule, equal parts of resorcin or ichthyol and zinc ointment forms a serviceable application. In a number of cases of accidental infection with pus-organisms in recently vaccinated infants, Dr. Himmelfarb used one-half drachm (2 gm.) of purified resorcin to one ounce (32 gm.) of glycerin. This solution was painted every hour by a camel's-hair pencil upon the diseased area and a surrounding healthy zone, and complete recovery took place within twenty-four hours.

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[1] Phila. Med. Jour., May 25, 1901.

Dr. Fessler, first assistant of Professor Nussbaum, of Munich, has published in a monogram the results of numerous bacteriological experiments and clinical observations relating to the influence of ichthyol upon cultures of the specific streptococcus of erysipelas. Weak solutions were found very destructive to this micro-organism, and the author concludes that ichthyol, employed early and energetically, will cure the disease by destroying its germ. The method of treatment consisted in rubbing vigorously, for ten minutes at a time, a strong ichthyol ointment into the affected surface and its vicinity. Any wound must be carefully disinfected and antiseptically dressed. From the author's table it appears that while from 1880 to 1888 the mean duration of the cases treated by other methods was about twelve days, and in no single year less than nine days, the ichthyol treatment reduced the length from 1886 to 1888 to an average of less than seven days, and in the first half of 1889 the duration had fallen to 5.6 days. W. F. Rodue has used the following combination in the treatment of facial erysipelas:

| | |
|---|---|
| ℞ Ichthyol | ʒij. |
| Etheris | ʒj. |
| Collodii flexilis | ʒj. |

M. Sig.: Apply locally with camel's-hair brush several times daily.

According to his report, this solution checks the spread of the disease, and quickly relieves the pain. In those individuals who are asthenic he gives tincture of ferric chloride internally and in suppurative cases calcium sulphide. Cavelli claims good results from the use of picric acid. He states that the swelling and pain are markedly decreased in from twelve to twenty-four hours. He employs an aqueous solution, one and a half parts of picric acid to two hundred and fifty parts of distilled water, applied externally five or ten times a day.[1] He conceives that the drug penetrates the horny layer, acts as a protective to the stratum Malpighii and restrains inflammation by its astringent properties. He suspects, moreover, that it is able to gain the interior of lymphatic conduits and destroy the micro-organisms on which the disease depends. Excellent results have been reported from Rosenbach's treatment, which consists in washing the erysipelatous patch, and the surrounding skin, with soap and afterward applying continually a five-per-cent. solution of phenol in absolute alcohol. For an alcoholic solution, Professor Ebstein substitutes a five-per-cent. carbolized petrolatum with, it is said, equally good results. For many persons this would be too strong, and the official three-per-cent. ointment would be more suitable.

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[1] Gazetta degli Ospedali, 1889.

Dr. Churiloff obtained good results from inunction with one or two per cent. parachlorophenol and ortho-bromophenol.

Since the erysipelas cocci are destroyed by ninety-per-cent. alcohol, Behrend has employed this agent as a local bath to a part attacked by erysipelas. The application repeated thrice daily was made to extend one-half inch beyond the border of the diseased patch. He found that the disease was quickly arrested, and in some instances completely cured within three to five days. Creolin, likewise, has been found efficacious, used in the strength of three parts to twenty-five parts of lanolin, or one part of creolin and four parts of iodoform to ten parts of lanolin. The hypodermic injection of three or four syringefuls of a three-per-cent. phenol solution is advocated by Hueter. The injection should be made along the border of the erysipelatous patch and into the tissues which the disease is about to invade. Dr. M. Strizover, of Soroki, Bessarabia, makes use of hypodermic injections of corrosive sublimate one grain (0.06 gm.), and phenol ten grains (0.60 gm.), dissolved in two ounces (64 gm.) of distilled water. His method is to inject a Pravaz syringeful of the solution at several points, a few drops at each. The same fluid is then rubbed into the parts for several seconds by means of cotton-wool; a layer of wadding saturated in the solution is then laid upon the surface and held in position by a gauze bandage. The dressing is changed in six or eight hours, and not more than one injection is generally needed. Warren Coleman reports twenty cases treated by the intravenous injection of colloidal silver (1 per cent), of which solution 8 to 10 minims were used. No bad results followed. Schmidt has reported three cases cured by these intravenous injections.

An ointment of corrosive sublimate made with lanolin has also proved of benefit. Wölfler asserts that the gentle and equable pressure of strips of sticking-plaster is successful in limiting the disease to the area covered by the dressing. He reported[1] twenty-four cases, in twenty-one of which this method had proved efficacious. A plan devised by Kraske, and slightly modified by Biedel and others, consists in surrounding the patch by a line of incision which is to be intersected throughout its length by short cuts crossing it at right angles. Ordinarily the incisions need to be but little deeper than those made in vaccination. The scarified surface is then washed with a five-per-cent. solution of phenol, and kept constantly wet with compresses soaked in a two-and-a-half-per-cent. solution. Some prefer using a sublimate solution (1:1,000) instead of the phenol. Dr. A. Seibert, of New York, has designed two small-toothed instruments by which the operation may be conveniently performed. If done upon the face, great caution will be required lest the incisions be made too deep and an unsightly scar be produced. Phenol or corrosive sublimate may be used, as by De Amicis, without scarification. This writer generally employs equal parts of phenol and glycerin, applied every second hour to the affected patch and a surrounding zone. In phlegmonous erysipelas, he follows Hueter's method of hypodermic injections. If the odor of phenol is intolerable to the patient, a one-per-cent. solution of corrosive sublimate in glycerin is substituted. Nolte applies mucilage of acacia containing three to five per cent. of phenol. Inunctions of turpentine have likewise proven beneficial. The following mixture is recommended as a topical remedy by Dr. Rothe:

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[1] Zeitschrift für Therapie, July 15, 1889.

| | | | |
|---|---|---|---|
| ℞ Phenolis hyd. | gr. xxj. | 1.36 | |
| Alcoholis, | | | |
| Tr. iodi ....āā | ♏ xxx. | 2. | |
| Ol. terebinth. rectificat. | f℥j. | 32. | |
| Glycerini | f℥iij. | 96. | M. |

The following, containing lead and opium is a common remedy, which acts efficiently in some cases:

| | |
|---|---|
| ℞ Plumbi acetatis | ʒj. |
| Tinct. opii | ℥j. |
| Aquæ | Oj. |

M. Sig.: Shake bottle and apply on lint saturated thoroughly with the solution.

Salicylate of sodium dissolved in glycerin is highly recommended. An ointment containing creosote or salol has been found beneficial. Dr. Dewar praises the action of a dressing of equal parts of sulphurous acid and water. A. H. Neuth observed good results from the topical employment of acetanilid made into an ointment with lard, lanolin, or other suitable excipient in the proportion of twenty grains (1.30 gm.) to the ounce (32 gm.). As erysipelas may originate from a point of infection within the nose, it is well to cleanse the nares at internals with a three-per-cent. solution of boric acid or with Dobell's solution to which dioxide of hydrogen may be added, as advised by Lehrnbecher.

Prof. E. Laplace, Philadelphia,[1] remarks on the increase of virulence that often occurs when infection is locked up in the subcutaneous tissues and reports experiments which he had made to find whether or not it is possible to alter the virulence of staphylococci and streptococci. He found as already stated that by taking a virulent strain of streptococcus and incubating it in an acid medium, the streptococcus changed to an apparently typical staphylococcus, while the same strain incubated in an alkaline or neutral medium retained streptococcic appearance and virulence. He also refers to his earlier discovery that the acidifying of a bichloride of mercury solution would take away its action of coagulating the blood, thus rendering it more useful as an antiseptic application. Applying these f the treatment of erysiplas, he has used acid, ice-cold bichloride of m solution locally in the treatment of this disease, making minute sc tions, especially for two or three inches beyond the infected area s lay open the lymphatic vessels. The venous capillary hemorrhag caused allows vast numbers of the infecting cocci to escape, and t cold compress, kept wet with the solution and applied to the lymphat sels, helps to destroy those remaining. If the infection is deeper, inv the cellular tissue, an incision should be made over the infected ar thorough drainage and disinfection. If the nose or some delicate of the face be involved the scarifications may be replaced by co acupuncture. Laplace has employed this method in a large numb cases, both in hospitals and private work, with unfailing success in cl ing from the first the starting infection, and he believes that by this treatment, in conjunction with the constitutional tonic treatment tincture of chloride of iron, all the indications will be met.

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[1] Journal of the American Medical Association, July 20, 1907.

Tucker[1] reports the good results obtained at the Philadelphia Ge Hospital, in his ward, in 19 exceptionally severe or complicated cas erysipelatous infection. In 35 uncomplicated cases all patients recov in from two to seven days, the pain and local discomfort being reliev a few hours. No other treatment was given. He describes the techn follows: The application consists of a saturated solution of magne sulphate in water. This is applied in facial cases on a mask consistin from fifteen to twenty thicknesses of ordinary gauze, of sufficient si extend well beyond the area involved, a small opening being made to mit breathing; no opening, however, is cut for the eyes. The mask is thoroughly saturated with the solution, applied and covered with silk or wax paper, and wetted as often as necessary to assure a dressing—usually once in two hours, depending on the time of year o temperature of the room. The dressing should not be removed of than once in twelve hours, to permit an inspection of the parts, and should be immediately reapplied; the infected area should not be w while the treatment is employed.

**Prognosis.**—Uncomplicated idiopathic cases of erysipelas inva terminate favorably. The occurrence of delirium indicates a grave but not necessarily a fatal one. Edema of the air-passages and emb of the cerebral vessels on the other hand are seldom followed by rec Pneumonia, pleurisy, and endocarditis are also unfavorable complica Pyemic and uremic cases usually die. Phlegmonous cases pursue a t course, and present a high death-rate. Gangrenous erysipelas is gen fatal. Alcoholic subjects as a rule are unfavorable cases.

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[1] "Local use of Magnesium Sulphate Solution in Erysipelas." Tucker, delphia, Therapeutic Gazette, Detroit, June 15, 1907.

## CHANCROID.

**Synonyms.**—Soft chancre, non-syphilitic chancre—Chancroïde—Schanker—Phagedena.

Chancroid is a localized virulent, contagious, specific venereal disease, characterized by the formation of one or more peculiar ulcers upon the cutaneous or mucous surfaces, accompanied by inflammation of the adjacent lymphatic glands, but not followed by any other symptoms of constitutional infection.

**Symptoms.**—The lesions of chancroid may occur upon any portion of the body, but they are most frequently observed on the genital organs. The glans and prepuce in the male, and the fourchette, labia majora, labia minora, and the lower part of the vagina and the uterine os in the female, are especially liable to be involved. The body of the penis and the urethra and scrotum in the male, and the uterus, urethra, perineum, and anus of the female, may also be affected. Chancroid of the fingers has occurred in gynecologists and accoucheurs as a result of infection through a cut or an abrasion while making a vaginal examination.

Chancroid has no period of incubation. The morbid process begins as soon as its essential virus is absorbed. If a drop of chancroidal pus be inserted beneath the epidermis, the point of insertion will be surrounded in a few hours by a faint reddish blush, which gradually increases in size and distinctness until the second day, when it appears as a well-marked inflammatory areola. A vesicle is then developed at the point of inoculation, and becomes converted into a pustule, which usually breaks spontaneously in a few days. The resulting ulcer is a typical chancroid, which does not differ in appearance or course from those which result upon the mucous membranes from impure sexual intercourse.

The interval of several days which sometimes elapses between exposure to contagion and the appearance of the lesion, is due to the fact that no abrasion of the surface occurred, and that absorption consequently could not take place until the acrid virus had corroded away the outer layers of the epidermis, or insinuated itself through the follicles into the interstitial spaces of the rete mucosum. Absorption is rarely delayed longer than a week, however; and, if an abrasion exists, well-marked symptoms may develop within a few hours. It has been estimated that in twenty-five per cent. of cases the lesions appear within two days; in twenty-five per cent. more, within four days; in thirty per cent. more, within six days; and in the remaining twenty per cent. at various times, from a week to twelve days.

Usually, within two or three days after infection, the characteristic lesion of chancroid becomes manifest. It consists of a sharply-defined round, oval, or irregular ulcer, with abrupt, perpendicular, or sloping edges. Its base at first is red and smooth, but soon becomes irregular and granulated, and covered with a gray or yellowish-white pultaceous material, consisting principally of pus. It is surrounded by an inflammatory non-indurated areola, and is continually secreting more or less thick white or yellowish pus, which may or may not be tinged with blood. If no treatment be instituted, the ulcer gradually increases in size for one or two weeks, frequently attaining a diameter of half an inch. In mild cases, a process of spontaneous repair may then begin. The inflammatory areola disappears; the secretion becomes altered in character, and finally ceases; healthy granulations spring up, and, if the destruction of tissue has not been too great, the healing process will be completed without the formation of a permanent cicatrix.

In severe cases, the ulceration continues to extend in all directions until a large area of the surface is involved. It then tends to assume a chronic character, and is subject to various modifications. In malignant, or phagedenic, chancroid the ulceration spreads deeply and widely, producing intense pain and great destruction of tissue. In some cases the rapidity and severity of this process are so excessive as to result in the sloughing of the glans or the entire penis, and destruction of the scrotum in a few days. In the female it is frequently productive of frightful and loathsome deformities.

Chancroidal ulcers may be single, but, as a rule, they are multiple. Owing to the auto-inoculability of their secretions, as well as to the fact that several abraded points may be infected at the same time, there is no limit to the number which may be present. I have seen a patient who had thirty-seven distinct chancroids, and instances are recorded in which a still greater number were observed.

All chancroidal ulcers are accompanied by more or less inflammation and infiltration of the surrounding tissues. In some cases the entire penis is enormously swollen; in others the infiltration is limited to the prepuce or the glans penis, producing phimosis or paraphimosis.

The most frequent complication of chancroid is bubo, or inflammation of the neighboring lymphatic glands. At times the lymphatic vessels leading to the glands also become red, inflamed, and hardened, and can be felt like hard cords beneath the skin. When it assumes this phase it is a genuine lymphangitis, which may eventuate in suppuration and the formation of small abscesses along the course of the inflamed lymphatics. It usually, however, terminates in resolution in a few days.

A bubo pursues a more prolonged course. Its presence is announced by swelling of the affected gland, and a sense of tenderness or pain upon motion. Buboes may occur upon any region of the body, but, as their exciting cause generally exists upon the genital organs, they are usually found in the groin. They develop during the first few days of the existence of the chancroid. They vary in size from a hazel-nut to a small cocoanut, in accordance with the number of glands involved, the intensity of the morbid process, and the state of the patient's constitution. They also vary in duration and termination. In mild cases there is no pain, but merely a sensation of discomfort, which passes away in a few days, and the swelling which is only moderate disappears in two or three weeks without suppuration. In severe cases the glands increase largely in size, and become intensely painful. The overlying integument is red and tender, and suppuration progresses so rapidly that fluctuation can be perceived in five or six days from the commencement of the swelling. The pain increases with the formation of pus until the bubo is opened or spontaneous evacuation of its contents occurs. The cavity of the ulcer which is exposed is similar to the chancroidal ulcer from which it originates. It secretes the same virulent pus, and is subject to the phagedenic and other complications of chancroid. If left untreated it may become chronic in character, and involve a large area of surface. Usually, however, the character of its secretion gradually changes, healthy granulations spring up, and a cure is finally effected by cicatrization.

**Diagnosis.**—The diagnosis of chancroid is frequently difficult. The principal affections with which it may be confounded are chancre, herpes, eczema, epithelioma, and innocent erosions or abrasions occasioned by sexual intercourse. Chancroidal ulcers are painful to the touch, rapid in development, and have no marked period of incubation. They are usually multiple, their secretion is copious, purulent, and auto-inoculable; their base is not indurated, and they rarely involve more than one lymphatic gland at the time. *Chancre*, on the contrary, is slow in development, painless to the touch, and has a well marked period of incubation. It is usually single, its secretion is thin, sanious, and not auto-inoculable. Its base is indurated, and it involves a chain of lymphatic glands in the groin, which rarely suppurate. The subsequent history of the case is also different. It must not be forgotten, however, that it is possible for the same lesion to contain the poison of both chancroid and chancre, and that while the rapid development of the symptoms of the former may obscure those of the latter for a time they will not prevent their final appearance. Consequently, a patient who is suffering with chancroid should not be assured that he has not contracted syphilis until the ordinary incubative period of that disease has elapsed without the development of its characteristic lesion and symptoms.

*Herpes* may usually be distinguished from chancroid by the presence of the minute vesicles of the former disease, the severity of the local irritation, the history of former similar eruptions, and the absence of progressive ulceration and glandular involvement. *Eczema* is attended by excessive itching and irritation, but is devoid of ulceration. In *epithelioma* the secretion is either absent, as in the early stages, or thin, sanious, and fetid, as in the later stages. The knobbed, wart-like, or cauliflower appearance, and painful character of the growth is also significant.

Simple *erosions* or abrasions of the glans, or of the prepuce, or of the body of the penis are of frequent occurrence, and may be mistake commencing chancroids. They are bright-red in color, and often co large area, and are at times the seat of a serous discharge. They d extend in depth, however, and, if not irritated and kept clear, wi variably disappear in a few days.

*Balanitis* has been mistaken for chancroid, but that error can r be avoided. In balanitis, the greater portion of the glans is involved the discharge is thick and purulent, but there is no inguinal involve no destruction of tissue, and all the symptoms rapidly disappear und propriate treatment. The ulcerations of tertiary syphilis present a ing resemblance to those of chancroid. Their edges, however, are indurated, their history is different, their course is slower, their sec is not auto-inoculable, and they are not accompanied by the form of suppurating buboes.

**Pathology.**—The pathological conditions which are present in croid do not appear to differ in any respect from those which occ ordinary ulcerative processes. The floor of the ulcer is formed b corium, destitute of papillæ, uneven and covered with pus-cells. The mucosum and the papillary layer of the margins are edematous, and trated with cells. The underlying corium is also thickened and infiltr The vessels of the corium are dilated and tortuous; their walls swollen surrounded by a network of new fibrous tissue.

**Etiology.**—Chancroid is due to the absorption of the peculiar vir another chancroid. The poisonous principle resides chiefly in the corpuscles, and we are warranted in supposing that it consists in a hith undiscovered specific micro-organism. Unna has described a stre bacillus, growing in the form of chains, which he has found in section chancroids. It is conveyed exclusively by contagion, which may, howe be mediate or immediate. There have been instances where it has b contracted by accoucheurs or gynecologists while making a vaginal exa nation, but in the main it is due entirely to impure sexual intercourse contact with the poison of a similar lesion on a mucous membrane.

**Treatment.**—The prophylactic treatment of chancroid is of the fi importance. The parts should be thoroughly cleansed immediately aft a suspicious intercourse, in order to remove any poisonous material. any abrasions be noticed, a physician should be consulted at once. Dilut solution of dioxide of hydrogen is useful for cleansing the surface.

After a chancroid has developed, the most effective treatment co sists in cauterizing the entire affected surface. By this means all dang of further contagion is averted, and the specific ulcer is changed into ordinary simple sore. Any active caustic may be used for this purp but those which are most frequently employed are the galvano-caute the actual cautery, nitric acid, and sulphuric acid. The galvano, and t actual cauteries possess the advantage of being only momentarily painf their action can also be easily restricted to the affected spot. Acids will sometimes diffuse over a portion of healthy tissue in spite of every precaution. The caustic alkalies are still more diffusive and very painful.

Fournier advises the use of a three-per-cent. solution of nitrate of silver, applied thrice daily upon a pledget of absorbent cotton. Solutions of dioxide of hydrogen or of chloral or Labarraque's fluid are likewise of service. Liquid phenol is also a good cauterant. Its application should be immediately followed by that of alcohol, so as to prevent injury from excessive action.

No matter what agent may be employed, care must be taken to thoroughly cauterize every portion of the sores, for if any of the virus be left undestroyed it will speedily multiply and invade fresh areas of the surface. The patient should avoid as far as possible severe labor or exercise. Alcoholic drinks should be prohibited.

After the chancroid has been thus effectually treated, it should be covered with powdered bismuth, subiodide of bismuth, or zinc-ointment, or any non-irritating application, and permitted to heal by granulation. The use of pyoktanin in weak solution, or powder, promotes the healing process.

If nitric or sulphuric acid is used, a solution of cocaine, creosote, or dilute phenol, may be first applied to the surface in order to lessen the pain. Letzel has found the solution of chloride of iron an efficacious application. In the course of four days a bright granulating surface results. Calomel may then be used as a dusting-powder, and in about five days more the sore will generally be healed. Iodoform is an excellent dressing, but its self-betraying odor is an objection. In such cases odorless iodoform, iodol, thymol iodide, or europhen may be employed as a substitute in the form of a powder or a five-per-cent. ethereal solution. If deemed advisable, iodol may be combined with alum or subnitrate of bismuth. It is not, however, according to the comparative studies of Dr. Szadek, of Kiev, as efficient as iodoform. Prior to applying the iodol, the surface of the ulcer should be carefully cleansed by means of a corrosive-sublimate solution and be cauterized. The powder should not be applied in such a layer as to cause retention of the discharge. Professor Stükovenkoff, of Kiev, praises the action of benzoate of mercury, which may be used either as a powder, or in watery solution (1 to 3 parts to 500). As it gives rise to considerable burning, it is advisable to add cocaine to the lotion. The sub-benzoate of bismuth is advocated by Dr. Finger. Dusted over the sore it gives rise to a slight burning sensation, which, however, soon passes off without any local irritation. In from three to six days the sore begins rapidly to cicatrize. Other efficient applications are: Bromine, ♏ x to the ounce (32 gm.) of olive-oil; a weak solution of sulphate of copper; a diluted fluid extract of hamamelis or hydrastis; an ointment of resorcin, naphthaline, ichthyol, or dilute nitrate of mercury. Salicylic and pyrogallic acids have also been recommended. The former is used as a powder, the latter as a pure powder, or mixed with starch or bismuth, as a ten- or twenty-per-cent. ointment, or dissolved in collodion or traumaticin. Formalin in very dilute solution has been found to be an excellent application, producing very rapid cicatrization.

Dr. Oscar V. Peterson advocates scraping out the chancroid with a sharp spoon, as is done in lupous ulcers. He previously cleanses the sore and surrounding skin with a solution of corrosive sublimate, or phenol afterward wiping the parts with a piece of cotton-wool soaked in ether. In order to render the operation painless, a two-per-cent. solution of hydrochloride of cocaine is injected beneath the skin. After the operation, a dressing of iodoform powder and gauze is applied. He states that by this method the duration of a case is materially shortened. The same writer speaks favorably of painting the surface of the sore with pure tincture of iodine, and also of excision of the sore and adjacent skin with subsequent applications of sutures. The wound heals in three days by first intention. Besides being painful, excision is unsuited to ulcers situated on the glans.[1] For the purpose of absorbing the discharge from the sore, keeping the surface dry, promoting cure, and preventing auto-inoculation, absorbent cotton has been usefully employed in the wards of Bellevue Hospital. The method of application is to surround the penis just behind the corona with a small roll of cotton kept in place by a rubber thread band. The dressing is light, and can be easily renewed as often as necessary. The more dry the surface of a chancroid can be kept the more rapidly will it heal.

Resorcin and acetanilid, suitably combined with some powder like bismuth or talc, are other substances which have been employed with advantage. If severe or erysipelatous inflammation develop, the affected part should be elevated and kept moist and cool by the application of cold water or lead-water and laudanum.

If phagedenic ulceration occurs, all sinuses and fistules must be laid open, all sloughs cut away, all pus removed from the surface, and unsparing cauterization with a hot iron or the galvano-cautery promptly resorted to. Prolonged immersion in hot water also has an excellent effect. If the pain be severe and the constitutional excitement high, morphine and aconite are to be administered, in sufficient quantity to allay pain and to moderate nervous and arterial tension. After these symptoms have abated, constitutional tonics, such as iron and quinine, with generous alimentation are required.

The formation of a bubo can not be prevented, but judicious treatment will frequently promote its resolution or prevent suppuration. As soon as the inguinal glands become enlarged or tender, the patient should be sent to bed, a saline cathartic administered, and tincture of iodine painted freely over the skin of the affected region. If the gland continues to enlarge and the pain to increase after this treatment has been persevered in for twenty-four hours, another saline cathartic may be administered, and a bag of ice applied at short intervals to the swollen gland. If there be no pain or inflammatory symptoms, but merely a progressive increase in the size of the bubo, constant pressure, as from a bag of shot or a disk of metal, held in place by a spica bandage will be the most effective remedial measure.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, September, 1889, p. 360.

If suppuration ensues, the bubo must be opened as soon as fluctuation is perceived, and its contents thoroughly evacuated. Its interior surface should then be thoroughly cauterized, and afterward dressed with an emollient ointment, and permitted to heal by granulation. Tonics and stimulants must be given whenever indicated.

In place of a large incision which will leave an indelible and unsightly scar of proportionate size, it will usually be found better to evacuate the pus either by a small opening, or a series of small openings, made with a narrow-bladed bistoury, or by aspiration. The cavity should then be irrigated by a weak solution of corrosive sublimate, and slight pressure be maintained by means of a compress of gauze or sponge and bandage. A small quantity of nitrate-of-silver solution may be used instead of the bichloride. Weilander has used benzoate of mercury by injection in one hundred cases of buboes. He finds that if the injection be made before fluctuation has occurred, it will in most cases prevent or greatly limit the production of pus; and that even when fluctuation is decided, if the skin be thick and well nourished, in about half the cases the necessity of evacuation will be obviated. A bubo may be very advantageously opened by the galvanic knife, and proper drainage is thereby favored, since the opening does not close so readily as that made by the ordinary bistoury.

Phimosis and paraphimosis may be relieved in accordance with the mechanical and surgical methods appropriate to each individual case.

**Prognosis.**—The prognosis of chancroid is always favorable so far as danger to life is concerned, but when phagedena occurs it occasionally pursues a tedious course, and may result in the production of permanent cicatrices or other deformities.

## SYPHILIS.

SYNONYMS.—Lues venerea—Grosse vérole—Lustseuche—Pox—True, hard or Hunterian chancre.

Syphilis is a virulent, chronic, contagious, systemic disease produced by the absorption, or inoculation, of a specific spirochete, the *treponema pallidum.* The disease manifests itself primarily by the development of an infectious lesion at the point of inoculation or absorption, soon followed by an involvement of the adjacent lymphatic glands, and later by a series of morbid manifestations, which first involve the skin and mucous membranes, and finally may extend to every organ and tissue of the body. As a general, though not invariable rule, one attack renders the patient insusceptible to a second infection or the development of a typical primary lesion as the result of subsequent inoculation.

**Symptoms.**—There are four, more or less well-marked, stages of syphilis: the primary, in which the force of the disease appears to be principally concentrated at the point of infection and in the contiguous lymphatic glands; the secondary, in which the cutaneous and mucous surfaces are mainly involved; the tertiary, in which the osseous, cartilaginous, muscular, and fibrous tissues are invaded; and the quaternary, in which the nervous system and the viscera are profoundly affected.

PRIMARY SYPHILIS.—After a period of incubation, which varies from ten days to several weeks, the presence of the virus of syphilis in the system is announced by the development, at the point of infection, of the characteristic initial lesion of the disease. This lesion, which is ordinarily known as "a chancre," or "hard sore" is generally situated upon the genital organs, but may appear upon any portion of the body which has been exposed to contagion. It sometimes forms at the meatus urinarius, or even within the urethral canal in the region of the fossa navicularis. In these situations, and especially the latter, it may lead a careless or inexperienced observer to a mistaken diagnosis of gonorrhea. The discharge, however, is more scanty than that of gonorrhea, the pain more localized, and an indurated spot is suggestive of chancre. The lesion rarely occurs in the deeper urethra, but Fitzgibbon has reported a case, under the title of "syphilitic gonorrhea," in which an induration about half an inch in diameter could be felt at and just anterior to the membranous urethra. Urination was impeded, a thin semi-purulent discharge existed, and the inguinal glands were enlarged. A papular syphiloderm subsequently made its appearance.

Accidents, careless or uncleanly habits, or unnatural connection, may lead to the development of a chancre in many unusual situations, upon the lip, tongue, tonsil, nipple, eyelid, nose, chin, anus, extremities, etc. During the ten years from 1878 to 1887 inclusive, Professor A. Pospelow, of Moscow, saw 198 cases of extra-genital chancres among patients belonging to the working classes. Of this number the lesion occurred upon the lip in 49 cases (in 20 men and 29 women); upon the gums in 1 (a man); the tongue in 3 (1 man, 2 women); the throat in 46 (14 men, 32 women); the breast, 69 (all women); the chin in 1 (a woman); the eyelids in 3 (men); the nose in 1 (man); the trunk in 10 (5 men, 5 women); the upper extremities in 6 (3 men, 3 women); the lower extremities—thigh, nates, 4 (women).[1] Statistics upon the same subject have been collected by Nivet,

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[1] Medical Bulletin, January, 1890, p. 17.

Morel, Lavallée, Veslin, and Foulard, from the service of Professor Fournier.

Chancre of the tonsil is, in fact, of more frequent occurrence than is generally supposed. This circumstance should be borne in mind, and lead us, in cases where an eruption of doubtful origin has the appearance of a syphilide, and the initial lesion can not be elsewhere found, to carefully inspect the mouth. Chancre of the tonsil is limited to one side, and is accompanied with pain and difficulty in swallowing and enlargement of the glands in front of the ear and below the jaw. The conjunctiva is the seat of the initial lesion in exceptional instances. The sclerosis is usually situated upon the free margin of the lid, but has been seen upon more remote portions of the palpebral membrane, and in six cases upon the ocular conjunctiva.

A *chancre* usually consists at first of a small round or oval abrasion of the skin or mucous membrane, which varies in size from a pin's head to a dime, about 2 cc. in diameter. It is almost invariably single. Its base is slightly depressed, dark red in color, and indurated, especially in men. The induration is sometimes less in women,[1] and in some cases entirely absent. What is known as the "parchment" chancre, with very superficial induration, gives rise to much doubt in diagnosis, and its incautious handling has frequently caused inoculation of the fingers of the examining physician. This primary lesion is not surrounded by an areola, and rarely suppurates freely unless irritated. Its secretion, which is thin, serous, and scanty, is highly contagious, but not auto-inoculable. If ulceration occurs, the secretion becomes sero-purulent in character, and the base of the ulcer is covered with a layer of gray, or dirty-white, aplastic lymph. At times, deep and extensive ulceration occurs, especially when the general condition of the patient's health is bad. Perforation of the urethra, with establishment of a urinary fistula, has been known to occur. Chancres situated in the groove behind the glans are particularly apt to ulcerate deeply and produce deformity. Those located in the pubic region often take on an ecthymatous appearance.

In the Hunterian or typical variety of chancre, the ulcer is deep and funnel-shaped, its edges are sloping, sometimes undermined and always indurated. Its base is hard and covered with lymph, and the lesion in its entirety feels to the touch like a split pea set in the skin. Another variety of chancre is that which appears as an elevated indurated papule, which may or may not become excoriated or ulcerated.

The initial lesion occasionally varies considerably in appearance from the preceding description. Dubuc has described a manifestation which he terms "herpetiform multiple syphilitic chancre," in which from five to fourteen small, round excoriations occurred on the prepuce and glans. Induration is but slightly marked. Braquehaye has reported from the Bordeaux Polyclinic the case of a woman, aged twenty-four years, in whom three chancres developed upon different parts of the face.[1] However atypical the form, the presence of induration is, in fact, the most constant and characteristic feature of the chancre. Nevertheless, there are exceptions even to this diagnostic sign. In women it is often extremely difficult to demonstrate any hardness of base. Even in men, cases are sometimes met with in which no hardness can be detected by the most careful examination. On the other hand, a case may be occasionally seen, as has been described by Kaposi and Dr. Edwin C. Burnett, of St. Louis,[2] in which sores with every mark of the Hunterian chancre, including the hardened base, are not followed by any secondary outbreak. Dr. Burnett offers the suggestion that in such cases the virus of the disease may be rendered inert in the first stage through some influence which we do not understand. This would be explained now, on Wright's theory, by assuming an increase in the opsonic index. Finally, the fact should never be forgotten that chancroids or non-venereal lesions may acquire an inflammatory hardness from cauterizing agents which patients have often used before seeking the surgeon. In some instances hardness due to inflammatory exudation very closely simulates the induration caused by cell proliferation.

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[1] W. E. Cant, F.R.C.S., in a report on clinical observations on "Induration, in the Primary Lesions of Syphilis in Women." British Medical Journal, February 12, 1887.

Ulceration, though usual, is not invariable, and the chancre occasionally may appear, in the form first described by Lanceraux, as a *papule sèche*, or dry papule, the induration feeling like a pea buried beneath the skin, the epithelium remaining absolutely intact. Very often it appears as what Bassereau has called the "superficial erosion," the sore being small, oval or circular in outline, with a reddish floor, scanty secretion, and resting upon a thin, hardened base known as "parchment-induration." Mauriac has called attention to a rare form of the initial lesion which he has called "infecting balano-posthitis," which might easily be mistaken for simple balano-posthitis. The mucous membrane of the prepuce is of a deep red color and thickened, and is usually slightly eroded. The glans may also be superficially thickened, and is likewise generally eroded.

Chancre, as a rule, is not accompanied by pain or any other subjective symptoms, and usually disappears in a few weeks without either cicatrization or pigmentation. In some cases, the lesion becomes attacked by phagedenic ulceration, or by gangrene, but these complications are extremely rare.

When a chancre is of large size, and accompanied by a great deal of edema and ulceration, it is apt to be followed by unusually severe constitutional symptoms.

Syphilitic bubo, or enlargement of the adjacent lymphatic glands, is a constant accompaniment of chancre, and usually occurs contemporaneously with the development of this lesion. It may exhibit itself upon any portion of the body where lymphatic glands exist, but is usually observed in the inguinal regions. The infection involves a group or cluster of glands, which become indurated and swollen. They vary in size from a small marble to a walnut. They are freely movable under the skin, and are not painful to the touch. They reach their maximum development in from two to four weeks, and after remaining stationary for several months gradually return to their normal size and condition. Suppuration is not usual, but may occur, probably from adventitious causes.

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[1] Medical Bulletin, November, 1889, p. 357.

[2] Journal of Cutaneous and Genito-Urinary Diseases, September, 1889, p. 325.

Queyrat has shown that chancre is inoculable upon the syphilitic subject himself, under certain conditions. It is necessary, in order that the inoculation may succeed, that the first chancre shall have less than twelve days' duration and that the patient shall not have had any treatment, local or general. Under these circumstances a positive result can be obtained twice out of three times. Roux and Metchnikoff, from experiments upon monkeys, concluded that immunity was complete within forty-eight hours. Queyrat claims that it is progressive and comes on slowly. These secondary or inoculated lesions are not accompanied by notable induration or adenopathy.[1]

**Diagnosis.**—The diagnosis of primary syphilis is usually made with little difficulty. The principal affections with which it is liable to be confounded are chancroid, herpes, and simple erosions of the cutaneous or mucous surfaces. *Chancroid,* however, usually begins as an angry-looking ulcer, which has no period of incubation; that is to say, it is noticed within a short period after exposure to infection, and is rapid in progress and attended by a high degree of inflammation. Its edges are abrupt and swollen, but not undermined or indurated, and its secretion is copious, purulent, and auto-inoculable. It is usually multiple, and painful. Finally, its accompanying bubo is extremely painful and highly inflammatory in character, tending to suppuration, and, with rare exceptions, is limited to a single gland. Chancre has a well-marked period of incubation, and usually begins as an apparently insignificant erosion, which is slow in progress and attended by a low degree of inflammation. Its edges are sloping and indurated, and its secretion is thin, scanty, and not ordinarily auto-inoculable, as already explained. As a rule, it is single and painless, and finally its accompanying bubo is composed of a number of glands, which become hard and swollen, but are not painful and rarely suppurate. In *herpes* there is generally a history of previous similar eruptions, and the lesions disappear in a few days without producing any glandular involvement. Accidental *simple abrasions* or "hair cuts" frequently can not be distinguished in appearance from the erosive form of chancre. They may be observed immediately after intercourse, however, and heal kindly in two or three days under the protective covering of a layer of bismuth subnitrate, zinc oxide, or some similar non-irritating application. If the intercourse has been of a suspicious nature, however, it must be remembered that there is a possibility of inoculation having occurred at the point of erosion, and consequently a decided opinion should not be given until sufficient time has elapsed (one or two months) without the appearance of any other symptoms.

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[1] Journal de Médecin Interne, Feb. 1, 1906.

LATER SYPHILIS.—In secondary syphilis, the cutaneous and mucous membranes are principally affected, but iritis, orchitis, and other complications which really belong to the next stage may develop. In tertiary syphilis, the deeper tissues of the body are involved, but lesions of the skin and mucous membranes may still be present. In quaternary syphilis, the cerebro-spinal system and the internal organs are the subject of the disease. The line between these varieties is not always well marked. Some of the eruptive symptoms belonging to the secondary group may be delayed until the tertiary stage, while occasionally grave nervous symptoms appear early in the course of the disease.

The development of the symptoms of secondary syphilis is usually preceded by marked constitutional derangement. The appetite is impaired, the bowels are constipated, the urine becomes scanty and high-colored and there is a sensation of general *malaise*. The patient is irritable and despondent, as if from a foreknowledge of impending illness. There is pain in the bones and around the joints, especially at night, which are so severe as to receive the name of osteocopic, or bone-breaking pains. Acute glandular swellings occur in various portions of the body. Muscular pains may also be present. Headache and vertigo are not uncommon. Insomnia, not due to pain, may occur, and in rare instances, especially among women, considerable mental disturbance may attend the outbreak of the secondary period. More or less feverishness may be manifested. In some cases the fever is periodical in character, and erroneously assumed to be of malarial origin. In others it may assume a continued type, may last for several weeks, during which the temperature may at times reach 104° F., and in rare instances may closely simulate typhoid fever. The absence of epistaxis, tympanites, gurgling in the iliac fossa, should, however, be sufficient to establish the diagnosis. Instead of the scanty eruption that belongs to typhoid fever, the symmetrical roseolar or papular rash of secondary syphilis makes its appearance. As a rule, the spleen is not enlarged in syphilitic fever. Prolonged syphilitic fever leads to emaciation, anemia, and serious debility.

During the febrile stage a decided loss of red blood-corpuscles occurs, varying from eleven to sixty-five per cent. At the same time the white blood-corpuscles are increased. This alteration in the composition of the blood leads in some instances to shortness of breath, palpitation of the heart and basal murmurs, edema, and epistaxis. With the fever and development of the eruption, an increased excretion of urea, creatine, phosphates, and sulphates takes place. Dr. J. V. Hjelmman states that a manifest anemia is produced and is at its height during the period of eruption. As the general symptoms subside the blood tends to regain its normal composition. Syphilitic fever occurs most frequently in those of delicate nervous organization, and especially in anemic women.

According to Dr. Oscar V. Petersen, albumin appears in the urine in 3.8 per cent. of patients with recent syphilis, in 3.8 per cent. of those having secondary symptoms, and 5.8 per cent. of those with late manifestations.

After premonitory symptoms have existed for several days, any doubt that may have been entertained is usually dispelled by the appearance of one or more of the characteristic syphilitic eruptions, or syphilides. Secondary syphilis usually manifests itself about six weeks after the appearance of the chancre, though exceptionally the period may be prolonged to eight or ten weeks. During the course of secondary syphilis a diminution or loss of the different forms of sensibility in certain regions has occasionally been observed.

In certain cases syphilis runs a very rapid course. Grave cutaneous lesions, which ordinarily do not appear for a year or more after infection, develop within the first few months and are accompanied by symptoms pointing to involvement of the viscera or nervous system. These cases are known as galloping, or precocious malignant syphilis.

A case of malignant may be contracted from one of ordinary syphilis. Intemperance and bad hygienic surroundings have much to do with the production of this severe form of the disease. According to Fournier, the previous occurrence of malarial intoxication is an important factor in causing malignity. Syphilis appears to be more virulent in the tropics than in the temperate zones.

Syphilitic skin lesions are known collectively as SYPHILIDES, which will now be considered. All the syphilides possess general features peculiar to them as a class, which distinguish them from non-venereal cutaneous eruptions. The most important of these characteristics are the color, course and grouping of the eruption, the polymorphism of the lesions, the character of the ulceration, the color of the crusts and scales, and the absence or insignificance of the subjective symptoms.

*Color.*—Their color varies with the size and situation of the lesions. Small macules and papules are usually bright red at first, but gradually acquire a dark-red or coppery hue. Large papules and tubercles present the characteristic raw-ham or copper-colored appearance from the beginning. As the lesions disappear, this hue fades and changes into brown, yellow, or dark-gray. In some cases the normal pigment of the skin is entirely destroyed or absorbed, and large white patches, resembling vitiligo, are formed. All the syphilides develop slowly, pursue a tedious course, and manifest a marked tendency to recur.

*Polymorphism.*—Polymorphism, or the tendency of several forms of lesions to appear at the same time is especially characteristic of the earlier syphilides, but it is also a feature of the later eruptions. A macular eruption is occasionally complicated by the development of papules. Papules, vesicles, and vesico-pustules may frequently be observed to be commingled, while in other cases tubercles, pustules, and ulcers are often present at the same time.

*Scales.*—The scales are usually few in number, and white or transparent in color. They are thin, friable, and easily detached. They are developed over the centre of the lesion, and rarely extend to the periphery.

*Crusts.*—The crusts or scabs are brown, dark-green, or black in color, and are firmly adherent at the periphery to the subjacent tissues. They are thickest in the centre, and frequently present a conical, vaulted, or laminated appearance.

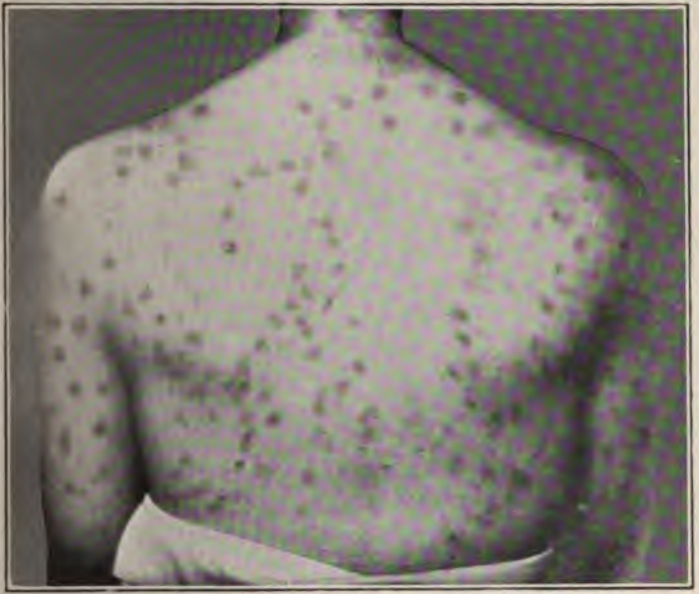
*Ulcerations.*—The ulcerations of late syphilis are apparently causeless in origin, and usually painless in character and protracted in duration. They all contain the specific organism, the treponema, and are therefore infectious, and their secretions are virulent.

*Subjective Symptoms.*—The syphilides, as a rule, are not accompanied by any subjective symptoms and when these occur, examination usually shows that they are not due to the development of the syphilide, but to pressure of the clothing or some other external irritation. Although as the rule syphilitic eruptions do not itch, yet it must be acknowledged that in exceptional instances, decided itching may occur. The lesions are seldom painful.

The syphilides may appear upon any portion of the cutaneous surface, but certain forms manifest a predilection for different regions of the body. The macular variety usually develops first upon the abdomen and thorax, and then extends to the back and extremities, but it rarely appears upon the face. The papular eruptions sometimes involve the forehead and cheeks, but are generally limited to the body. The pustular syphilides attack the entire surface, but are most marked on the scalp, the face, and the extremities. The squamous variety is most frequently observed on the elbows and knees, and the palmar and plantar surfaces. All syphilides show a tendency to symmetrical distribution on opposite sides of the body and extremities, and have a preference usually for the extensor over the flexor surfaces.

The syphilides may be divided into two principal groups—those which occur in the secondary, and those which occur in the tertiary stage. The first group comprises the macular, the pigmentary, the papular, the papulo-squamous, the vesicular, and the small pustular varieties; the second consists of the large pustular, the tubercular, the bullous, and the gummatous.

PLATE VI



Macular Syphiloderm, Nine Weeks after Appearance of the Initial Lesion. (See page 267)

The lesions of the secondary group are superficial, generalized, numerous, and symmetrical; those of the tertiary are deeper-seated, localized, few in number, and asymmetrical.

Rebellious syphilides have occasionally been known to disappear under the influence of an attack of erysipelas or variola.

## MACULAR SYPHILIDE.

SYNONYMS.—**Roseola syphilitica—Erythematous syphilide—Macular syphiloderm.**

Syphilitic roseola is usually the first symptom of secondary syphilis, and is generally developed about six weeks after the appearance of the initial lesion. The appearance of this eruption, according to Fournier, is the first positive and unmistakable evidence that the patient is suffering with syphilis. The diagnosis of the initial lesion cannot be established beyond possibility of error, previous to the eruption of the macular syphilide. It may appear at the end of the fourth week, however, or may be delayed for two or three months. It consists of a number of small round or oval spots, which are indistinct in appearance at first, but soon become bright-red in color, and, subsequently, as they increase in size, gradually change to dark-red or brown. They are generally on a level with the surrounding surface, but occasionally they are slightly elevated or semi-papular in character. They usually appear first upon the abdomen, and then extend over the thorax and the extremities, but they rarely involve the face or the hands. The eruption attains its maximum development in three or four days, and then remains unchanged for several weeks or months, after which it slowly changes in color to dark-yellow or yellowish-brown, and then finally disappears without pigmentation or desquamation. The spots often pass unnoticed by the patient, but probably occur in all cases.

The macular syphilide sometimes recurs, not, however, as a rule, soon after its subsidence, but after the lapse of several months. The relapsed eruption is apt to be limited to certain parts of the body. It is not attended by any subjective cutaneous symptoms, but is frequently preceded and accompanied by marked sore-throat and severe osteocopic pains. Alopecia is also of frequent occurrence. Relapses are common.

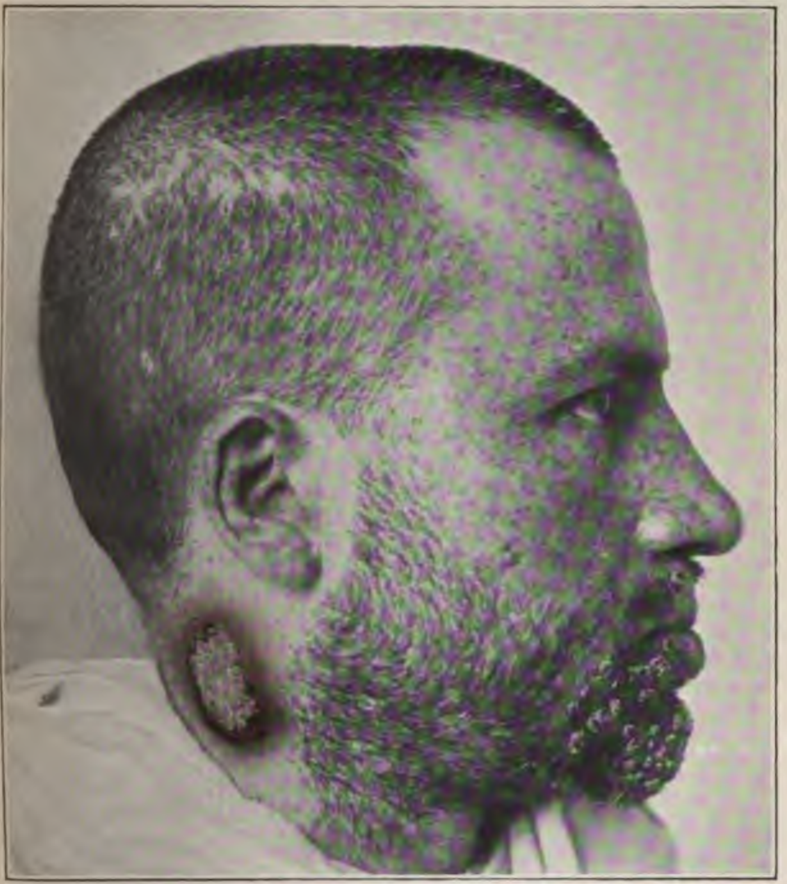
The earliest form of sore-throat is that known as faucial erythema, or pharyngitis, with or without swelling of the roof of the mouth, soft palate, or fauces. Somewhat later, in the same situations and upon the tonsils or in the pharynx, and inside of the lips or cheek, the mucous membrane may display several round, or oval, opaline patches. These present a milky appearance, and resemble spots to which a solution of nitrate of silver, or phenol, has been applied. Synovitis sometimes coincides with the development of roseola. Occasionally a dry pleurisy is met with at this stage.

**Diagnosis.**—The diagnosis of the macular syphilide is comparatively easy. The only eruptions resembling it are those of rötheln, roseola, tinea versicolor, and those due to the administration of certain medical substances. The eruption of *rötheln*, however, consists of irregular blotches, and is accompanied by more or less catarrhal symptoms, and rarely occurs after childhood. The spots of *roseola* are irregular in size and ephemeral in character, and are caused by some gastro-intestinal disturbance. The patches of tinea versicolor are usually very large, yellowish or brown in color, furfuraceous in appearance, irregular in outline, and increase in size by peripheral extension. They are slow in development and continue unchanged for a long period. Microscopic examination will reveal the parasite. *Medicinal eruptions* are sudden in development and are accompanied by more or less itching, and usually disappear as soon as the exciting cause is suspended or removed.

PIGMENTARY SYPHILIDE.—This rare affection is characterized by the development of round, oval, or irregular patches of pigmentation in the skin. Sometimes there seems to be rather a disarrangement than an actual excess of pigmentation. Spots of variable size and shape develop, exhibiting a blanched centre surrounded by a dark margin. This form is most frequent upon the sides of the neck. It has received the special title of *leucodermia syphilitica* by some writers. The lesions vary in color from dark-gray to yellowish-brown, and in size from that of a pea to an inch or more in extent. They have even been seen as large as the palm. Neighboring spots may coalesce as they enlarge. They are smooth to the touch, and are not elevated above the surrounding normal skin. The coloration is in some cases so faint that they are with difficulty perceived unless viewed in a strong light and in an oblique direction. They are most frequently met with upon the face and neck, but they also occur upon the thorax, the abdomen, and the extremities. They are not accompanied by any subjective symptoms. They appear more abundantly on women than on men, and do not appear to differ in any essential respect from the lesions of chloasma. They run a protracted course, remaining for several months or years, and are not amenable to anti-syphilitic treatment. These patches may eventually disappear, leaving no trace behind them, or the pigment may be entirely absorbed and a spot resembling vitiligo remain. They are usually met with during the first year of the syphilitic manifestations, and are probably produced by the disturbing effect of the syphilitic poison upon the terminal filaments of the cutaneous nerves.

Audry has had the opportunity of examining sections taken from a case of generalized pigmentary syphilide. The pigmented spots were formed by a pigmentary infiltration composed of small, yellowish blocks, themselves formed by finely aggregated granulations. They are also found here and there in the papillæ, and were seen in the superficial layers of the derma. But their chief deposition is in the generative layer and the adjacent stratum mucosum. The arterioles and capillaries were intact, and no evidence of recent or remote hemorrhage was detected. Audry believes

PLATE VII



Syphilitic Lesion of Face and Neck with some Pigmentation of Face, the Result of Previous Lesions.

(See page 268)

hat the pigment is brought from the derma by the pigmentiferous coruscles. He found no signs of chronic inflammation.[1]

## PAPULAR SYPHILIDE.

The papular eruptions of syphilis consist of two principal groups or lasses—the small acuminated, or miliary papules, and the large, flat, or nticular papules. The papulo-squamous syphilide and the broad condymata or mucous patches may be regarded as modifications of the lenticlar variety.

Small Papular Syphilide (*Synonyms:* Miliary papular syphilide; chen syphiliticus).—This eruption consists of a number of minute, round, cuminated papules, which vary in size from a mustard-seed to a small hot. They are bright-red in color at first, but become dark-red or reddishrown in a few days. They are firm to the touch, and are slightly elevated bove the surrounding integument and covered with minute scales. Some, specially those which are formed around the hair-follicles, may become transformed into vesicles, and then into pustules, but the majority remain papular, and finally disappear by resolution or by fatty degeneration and absorption. This eruption is one of the earliest manifestations of secondary syphilis, generally appearing within three months after the development of the primary lesion. It is symmetrical in character, and diffused more or less over the entire surface. The papules manifest a tendency to develop in groups or clusters of a dozen or more. This grouping is especially well marked upon the face, shoulders and arms. The eruption is chronic in character, and liable to recur, but is not accompanied by pain or itching. In severe cases it is followed by the formation of minute permanent cicatrices, indicative of atrophy of the corium. Slight pigmentation may also remain.

**Diagnosis.**—The small papular syphilide might be mistaken for papular eczema, lichen ruber, or lichen scrofulosus. The lesions of papular *eczema,* however, are usually localized, and accompanied by marked itching and burning sensations. They soon become vesicular in character, but do not develop in clusters. The miliary papules of syphilis, on the contrary, are generalized, and are not usually accompanied by any subjective symptoms. They only occasionally become vesicular, and almost always develop in clusters. Very often there is a history of an antecedent syphilitic lesion. In *lichen ruber* the eruption is accompanied by severe itching and burning, but it never appears upon the face, and pursues a different course. In *lichen scrofulosus* the papules are situated upon the trunk, and are accompanied by other evidences of the scrofulous diathesis.

Large, Flat, Papular Syphilide (*Synonym:* Lenticular syphilide). —This eruption appears later, as a rule, than the miliary papular syphilide, and is significant of a more obstinate form of the disease. It consists of a number of large, flat papules, which vary in size from a small shot to a bean. They are round or oval in shape, firm and smooth to the touch, and are elevated above the surrounding surface. They are light-red in color at first, but soon assume the characteristic raw-ham or copper color. They are devoid of scales, and present a dull glazed appearance. They are usually developed in large numbers, but not as abundantly as the miliary lesions. They run a protracted course, and frequently recur. They may appear upon any portion of the body, but are especially observed upon the neck, back, shoulders, and the extremities, and around the genital organs. They are also found upon the scalp, and on the forehead, where they form the characteristic "corona veneris." They slowly increase in size by peripheral growth during the first few weeks of their existence. They then remain stationary for several months, usually disappearing by disintegration and absorption, leaving more or less pigmentation and atrophy to mark their location.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, July, 1890, p. 281.

Occasionally, while the centre undergoes retrogression, the periphery has invaded the surrounding integument, blending perhaps with other lesions of the same kind, forming annular, oval, or circinate figures. Usually the border exhibits a fine scaling. In favorable situations the lesion may be converted into a mucous patch. This manifestation of the disease is much more common in negroes than in whites, as has been pointed out by Dr. Atkinson, of Baltimore, and Dr. Hardaway, of St. Louis. In some cases excoriation and ulceration take place; in other cases they become converted into pustules. In depressed conditions of the system, or when the disease is unusually virulent, the large, flat papules may, after superficial necrosis has occurred, become covered with a thin diphtheroidal membrane of a dirty-gray color.

In exceptional cases the large papule occurs as the first cutaneo manifestation of the disease. In others, a few large papules may be prese at the same time with a macular syphilide. Usually, however, this fo of eruption is developed in the later periods of the secondary stage a may be encountered as late as the second or even the third year after t original infection. It is generally more abundant the earlier it appea Thin, yellow, and easily detached scales sometimes form upon the surf of the lesions, when they are situated upon parts which abound in sebaceo glands. In rare cases the papules, growing unusually large, project abo the surface so as to bear some resemblance to a cauliflower or raspberry The rounded prominences are smooth, red, of different size, and betwe them slight ulceration gives rise to some pus. This pus may become d and form a crust. When abundant, it gives rise to a very offensive ode This unusual transformation has been most often seen upon scalp, f shoulders and genitalia. It has been termed the frambesoid, vegetati or verrucous syphilide. A very similar appearance is sometimes present by the ulcerated tubercular syphiloderm; and De Amicis, of Naples, has seen macules of the forehead become converted into a berry-shaped mass.

The most common forms of transformation which they undergo, however, are into moist and squamous papules.

MOIST PAPULES (*Synonyms:* Mucous papules; mucous patches; condylomata).—Moist papules, or mucous patches occur only in syphilis. They consist of large, flat papules, which have been modified by the combined influence of heat and moisture. They are seen on the tongue, tonsils, lips, anus, vulva, and other mucous surfaces. They are also found on the perineum and the scrotum, in the axillæ, beneath the mammæ, between the toes, in the groins, around the umbilicus, and on any other portion of the body where opposing surfaces come in contact with each other. They vary considerably in size. Some of the large condylomata frequently measure one or two inches in diameter. They are usually slightly elevated above the adjoining surface, but may be.depressed beneath it. They are soft and smooth to the touch, and vary in color from dark-red to gray. Their surface is usually moist, and covered with epithelial *débris.* Adjacent lesions frequently coalesce, forming large patches. Excoriation and ulceration may also occur, or hypertrophic granulation take place, resulting in the formation of large warty or vegetative excrescences.

Mucous patches of the tongue and lips are irregular in shape, and usually deeply fissured, and more or less painful, but they rarely ulcerate or become the seat of vegetative growths.

PAPULO-SQUAMOUS SYPHILIDE.—This eruption usually appears late in the course of the disease. It is symmetrical in character, and may involve any portion of the integument, but its favorite seats are the palmar and plantar surfaces. It consists of a few large, round, oval, or oblong, flat papules, which are slightly elevated above the surrounding surface, and are covered by a thick, dry, white or grayish non-imbricated scale. These papules increase in size by peripheral growth, and frequently coalesce, forming large irregular patches. The scales are only slightly adherent, and can easily be detached, exposing the dark-red surface of the papules beneath. When the scales are removed they are slowly replaced. This form of syphilide is chronic in character, and may remain for years. It finally disappears by cessation of this scaling process, and absorption of the infiltration.

In severe cases, affecting the palmar and plantar surfaces, the so-called syphilitic psoriasis, the patches attain a large size, and are deeply fissured and painful. The nails occasionally become involved.

**Diagnosis.**—The diagnosis of the large papular syphilide is usually easy. The only affections resembling it are lichen planus, acne, and psoriasis. The papules of *lichen planus*, however, are angular in outline, depressed in the centre, and are limited to the forearms and legs, never appearing upon the face or neck. They are also covered by a large, waxy, transparent scale and are followed by slate-colored pigmentation, which slowly disappears. The lesions of the papulo-squamous syphilitic eruption are round or oval in outline, not umbilicated or depressed in the centre, not covered with a waxy scale; they are diffused over several regions of the surface and do not cause pigmentation. The papules of *acne* are acuminated in form, bright-red in color, and are confined to certain regions of the body, as the face and neck. They are also mostly brief in duration, frequently becoming pustular, and disappearing by absorption. The eruption of *psoriasis* may at first resemble the lesions of the papular syphilide, but the development of the characteristic mother-of-pearl scales of the former disease will effectually settle the question of diagnosis.

The papulo-squamous syphilide might be mistaken for one of the forms of psoriasis, or for squamous eczema. The lesions of psoriasis, however, are numerous and diffused, while those of the syphilide are few and localized. Psoriasis rarely affects the palmar or plantar surfaces, and never appears there without involving some other portion of the integument at the same time. Superficial desquamation is profuse in psoriasis, and scanty in syphilis. When the scales are removed in psoriasis, a bleeding or bright-red surface is exposed; when they are detached in syphilis, a dark-red papule is discovered. The lesions of psoriasis develop rapidly, and are accompanied by more or less itching; those of syphilis develop slowly, and are not attended, as a rule, by any subjective symptoms. Finally, the lesions of psoriasis are uniform in character, manifest a predilection for the extensor surfaces, and are covered by the characteristic waxy or mother-of-pearl scales; while those of syphilis are polymorphous, and *are found on the flexor rather than on the extensor surface*, and are covered by a grayish or dirty-white scale.

There are some lesions resembling moist papules, or mucous patches which are simply acuminated, papillary new formations. They are due to local irritation of the cutaneous or mucous surfaces by acrid discharges, and spring from apparently normal tissues. The syphilitic lesions, on the other hand are surrounded by more or less infiltration.

The patches of squamous eczema are irregular in shape, and are accompanied by itching and burning. They pass imperceptibly into the surrounding healthy skin, and are not surrounded by infiltration.

## VESICULAR SYPHILIDE.

This is a rare and late manifestation of secondary syphilis. It usually appears within six months after the development of the primary lesion, but in some instances not for a year or more. The vesicles vary considerably in size, shape, and distribution. In some cases they are small and clustered together, as in eczema; in others, they are large and isolated, as in varicella. In the former they are minute in size, conical in shape, and arranged in groups or patches, and are generally observed on the trunks and extremities, rarely or never appearing on the face. They are seated upon a dark-red base, and are usually situated around the hair-follicles. They terminate either by absorption, or by transformation into pustules which break and discharge, leaving a small ulcer, which heals without the formation of a scar. They are not accompanied by any subjective symptoms.

The large, varicella-like vesicles are developed upon a reddened, infiltrated base, and frequently attain the size of a bean. They are few in number, and scattered over the face, trunk, and extremities. They contain at first a clear, serous fluid, which becomes purulent in a few days. They finally either dry up, or rupture spontaneously and discharge their contents. A greenish-brown crust is then formed, which is cast off in a fortnight, leaving a slight purplish discoloration, which gradually disappears. Again, successive crops of vesicles may appear and protect the eruption for months. Itching and burning are absent during the whole course of the disease.[1]

**Diagnosis.**—The small vesicular syphilide resembles eczema in many particulars, but the distinction can always be made by remembering that the vesicles of eczema are of brief duration, accompanied by intense itching and burning sensations, and are not situated upon a reddened, infiltrated base. The lesions of the large vesicular syphilide might be mistaken for varicella or varioloid, but a consideration of the dark-red, infiltrated base, the history of the case, and the course of the eruption, will lead to a correct conclusion.

### PUSTULAR SYPHILIDE.

Pustular manifestations, as a rule, are indicative either of a more severe form of the disease or a depraved or impoverished condition of the patient's tissues. They are produced by secondary infection. Individual pustules differ in size, shape, and number. They are usually surrounded by a reddish areola, and are situated around the hair-follicles and sebaceous glands. Sometimes they are diffused over all portions of the surface, but are most frequently met with upon the trunk and the extremities. They generally begin as papules or vesicles, which are rapidly transformed into pustules; indeed, so quickly, in some, that the papular or vesicular stage of the eruption escapes observation; in others, the pustules are slowly developed upon lesions which have been in existence for weeks or months.

The pustular eruptions of syphilis are sometimes termed "pustulo-crustaceous eruptions," from their tendency to terminate in crusts. This tendency is especially manifested by the larger pustules. The crusts generally correspond in size and shape with their pre-existing lesions. They may be soft and friable, but are usually firm and hard; and in color range from yellow or brown to dark-green and black. Each crust is situated over an ulcer, which may be superficial or deep, in accordance with the character of the primary pustule. The ulcer presents clean-cut edges, giving it a punched-out appearance. Its border is sharply defined, and surrounded by a slight area of infiltration. Its base is uneven, and covered with a profuse gray, yellow, or greenish purulent secretion. Repair is protracted, but finally takes place by granulation, ending in the formation frequently of a permanent cicatrix. More or less pigmentation also results.

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[1] Some recent writers regard the vesicular eruption as an accidental manifestation and not distinctive of syphilis, classifying it with the pustular syphilide.

The pustular syphilides may be conveniently regarded as consisting of four principal groups: the small acuminated, the large acuminated, the small flat, and the large flat varieties.

SMALL ACUMINATED, PUSTULAR SYPHILIDE (*Synonym:* Miliary Pustular Syphilide).—This variety of the pustular syphilitic eruptions is the first of the manifestations of secondary syphilis. It, with a few exceptions, appears in from six weeks to three months after the development of the initial lesion, and is usually accompanied by syphilitic fever, erythema and soreness of the fauces, and more or less falling of the hair. It may not appear, however, until later in the progress of the disease. It consists of a number of minute pustules, which are developed around the orifices of the hair-follicles, and are generally penetrated by a hair. They are rarely larger in size than a grain of barley. They are situated upon a minute, reddish, elevated or papular base. They are spherical or acuminated in form, and contain a drop of sero-purulent matter, which soon becomes converted into a yellow, friable crust. This crust drops off in a few days, leaving a slight depression in the epidermis, which is likely to become the seat of subsequent pigmentation or desquamation.

The pustules sometimes are isolated, but they are usually arranged in irregular groups, and widely diffused, occasionally covering the entire surface. The thorax and back and the extremities are most frequently involved, however. The eruption is often complicated by the presence of papules, vesicles, and papulo-pustules.

LARGE ACUMINATED, PUSTULAR SYPHILIDE (*Synonyms:* Acne syphilitica; Variola-form syphiloderm).—This variety of the syphilides is seen early, but not as soon as the miliary, papular and pustular forms. It usually appears from the fourth to the sixth month after infection, but may be delayed for a year. It consists of a number of pustules, which are round and acuminated in form, and vary in size from a split pea to a small bean. They are situated around the hair-follicles, and are developed upon a dark-red or copper-colored base. They are elevated above the surface, and surrounded by a coppery areola. They develop first as small red spots, which rapidly become papular and then pustular. They contain a yellow, purulent fluid, which sooner or later becomes dried up and converted into a thick, yellowish or brownish crust, beneath which a superficial ulcer exists. The crust finally drops off, and the ulcer heals by granulation followed by a minute cicatrix. The pustules may be disseminated, but are usually grouped. They are few in number, and limited to the face and shoulders. They may, however, extend to the scalp and trunk, and in severe cases involve the entire cutaneous surface. They develop either rapidly or slowly. They are not often attended by pain or itching, or any other subjective symptoms. The individual pustules generally disappear spontaneously within two or three weeks after their first appearance, but new lesions appear from time to time for several months.

SMALL FLAT, PUSTULAR SYPHILIDE (*Synonym:* Impetigo syphilitica).—These are two varieties of this form of eruption—the superficial or aggregated, and the deep-seated or discrete. The superficial variety is characterized by the formation of a number of small, flat pustules, which are seated upon a dark-red, infiltrated base. They begin as circumscribed, reddish elevations of the surface, which speedily become papular and then pustular. They are developed in groups, and frequently coalesce to form large irregular patches. They are surrounded by a dark-red areola, and soon become covered by dry, yellowish, greenish, or brownish crusts, beneath which more or less superficial ulceration exists. They rarely appear before the second year of the disease. They may appear upon any portion of the body, but are most frequently observed upon the face and scalp and around the genital organs. They are also met with upon the legs and forearms. They run a comparatively mild course, and heal without much permanent cicatrization.

The deep-seated pustules are isolated and few in number. They usually occur upon the scalp or on the extremities, and rarely involve the face. They belong to the tertiary rather than to the secondary stage, and may not appear until the third or fourth year of the disease. They begin as papules, and become transformed into pustules, which pursue a protracted course. They are surrounded by a coppery areola, and covered by a thick, blackish-green crust. The underlying ulcer is deep and indolent, and covered with a grayish or greenish purulent secretion. Repair gradually occurs by granulation and cicatrization, but it may be delayed for months, and is always followed by permanent disfigurement.

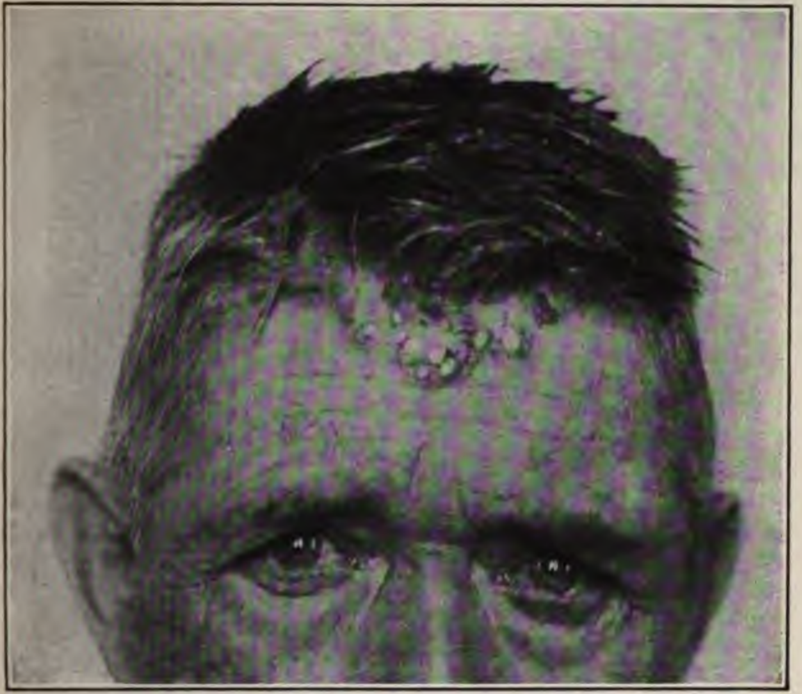
LARGE FLAT, PUSTULAR SYPHILIDE (*Synonym:* Ecthyma syphiliticum).—This eruption consists of large flat, isolated pustules, which are situated upon a reddened, infiltrated base, and surrounded by a coppery areola. They are irregular in shape, and are from a sixteenth to a half or an inch in area. They appear during the tertiary stage, seldom before the third year of the disease. They evince a marked tendency to break down early, and become covered with their characteristic crusts. Any portion of the body may be affected, but they are usually confined to the back, shoulders, and extremities. There are two varieties of this form of eruption—the superficial and the deep. In the former, the pustules are numerous and disseminated, and run a comparatively brief course. The crusts which are formed by the breaking down of the pustules, are flat and firmly adherent, and yellow or dark-brown in color. The underlying ulcer is superficial, and heals with slight cicatrization. The pustules of the latter are few and isolated, and generally limited to one region or one side of the body. The crusts which are formed by the breaking down of the pustules are conical in shape and dark-green or blackish in color, and seated upon large, deep, unhealthy ulcers. The edges of the ulcers are infiltrated, and their surface is covered with a scanty, foul, greenish-yellow secretion. In some cases the ulcerative process remains stationary, in others it extends peripherally. As a result of this extension, and the continual drying up of the matter which is poured out, the crust is elevated still higher in the centre, and gradually assumes a stratified or oyster-shell appearance. This form of crust is known as rupia, but is not peculiar to the pustular syphilides. It is frequently observed in the bullous group, and is symptomatic of the malignancy of the disease. It is invariably followed by marked cicatrization.

**Diagnosis.**—The pustular syphilides are not difficult of diagnosis. The lesions of the acuminated variety might be mistaken for the pustules of acne or of variola. In *acne*, however, the pustules are usually limited to the face and shoulders. They are not surrounded by the coppery areola of the syphilides, and are not arranged in groups. They run a rapid course, appearing and disappearing quickly, but are followed by successive crops, which protract the course of the eruption. Moreover, there is no history of a specific infection, nor are there any other symptoms of syphilis present. Rare cases of universal pustular syphilis may present a striking resemblance to *variola*, but the slightest examination of the pulse, temperature, and history of the patient will suffice to show the true nature of the disease.

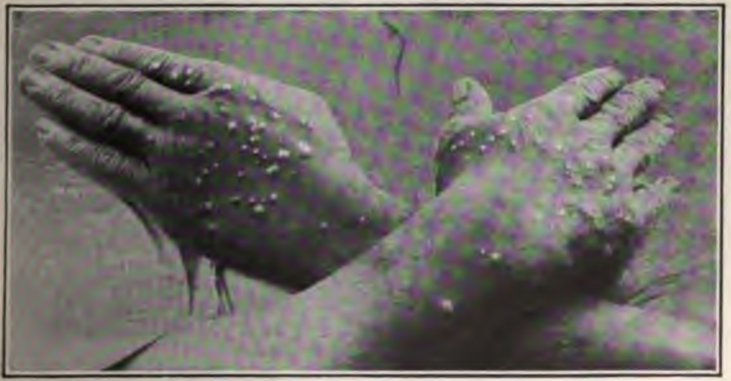
The small flat pustular syphilides can be distinguished from simple *impetigo* and pustular *eczema* by their infiltrated base, their coppery areola, their chronic character, and the absence of subjective symptoms. Moreover, the crusts of the syphilitic lesions are situated upon an ulcerated base, while those of eczema and impetigo are seated upon a simple reddened or oozing, non-ulcerated surface.

The large flat pustules can be recognized from those of ordinary *ecthyma* by the history of the case, the presence of a coppery areola, the rupial appearance of the crust, and the obstinate character of ulceration. In a certain class of cases, fortunately rare, lesions that usually occur only in the later secondary stage, develop rapidly at an early period of constitutional involvement. This variety is appropriately termed malignant precocious syphilis. The outbreak is often preceded by a severe fever which may assume either a periodical or continued type. The eruption is

PLATE VIII



Tubercular Syphiloderm, or Tuberculous Syphilide.
(See page 277)



Hands Showing Tubercular Syphilis.
(Same case as above.)

generally of pustulo-crustaceous form, and exhibits the appearance of syphilitic ecthyma. Iritis, periostitis, and visceral involvements may be simultaneously manifested. Nutrition is seriously impaired, and death by exhaustion or toxemia, not infrequently results within a few months of infection.

## TUBERCULAR SYPHILIDE.

This eruption belongs to the tertiary stage of syphilis. It rarely appears before the second year of the disease, but most frequently during the third and fourth years. It may be delayed, however, for five or ten years, or even longer. On the other hand, in exceptional cases it may appear during the secondary stage, when it is generally distributed over the entire body. It consists of a number of tubercles, or solid elevations of the skin, which vary in size from a split pea to a chestnut. The spots are round or oval in shape, dark-red or reddish-brown in color; are firm and smooth to the touch, and present a glistening appearance. They are usually seated in the corium, but may extend into the subcutaneous connective tissue. The tubercles are generally multiple, but are not often present in large numbers. They may be widely disseminated, but are usually limited to one or two regions of the body. The face, neck, and shoulders appear to be favorite localities for their development. They are seldom observed upon the extremities. When a number of tubercles appear upon any portion of the body they manifest a tendency to develop clusters or groups, or segments of circles, and finally coalesce and form irregular or serpiginous patches. In some cases these patches are kidney-shaped, in others they resemble a horse-shoe. The development of the tubercles is slow and unaccompanied by any subjective symptoms.

After attaining their maximum growth they remain stationary for several months, and then disappear, either by fatty degeneration, absorption, or by ulceration. When they disappear by absorption, more or less pigmentation and depression of the epidermis are observed at their site for a long time. Finally, however, the skin regains its normal color and appearance.

The ulcerative process may begin either upon the surface, or in the interior of the tubercles; but, no matter where it commences, it does not cease until all of the material composing the tubercle has been destroyed. The resulting ulcer will be either superficial or deep, in accordance with the depth to which the syphilitic new formation has been imbedded in the skin. Its edges are dark-red and infiltrated, and its base is covered by a grayish, yellowish, or greenish secretion. It is round, oval, or irregular in shape, and not infrequently crowned with a thick, pigmented crust.

When a group of tubercles become attacked by the ulcerative process, an extensive irregular or serpiginous excavation is produced, involving the whole affected surface. Repair gradually occurs by granulation, leaving large permanent glistening cicatrices, which are unusually depressed beneath the level of the adjacent skin.

The ulceration is sometimes complicated by exuberant papillary or wart-like excrescences, which spring up from the base of the ulcers. They are covered by an offensive, yellowish, semi-purulent secretion, and vary in size. They are met with most frequently upon the scalp and around the genitalia, forming the so-called syphilis cutanea papillomata.

**Diagnosis.**—It is claimed that all the lesions of syphilis occurring in the skin, contain the spironema pallidum or the treponema pallidum of Schaudinn, which can be recognized by the usual staining methods, so that the character of a growth may be determined by examining a section microscopically. The tubercular form of syphilis is usually not difficult of diagnosis, clinically. The only affections which resemble it are lepra, lupus vulgaris, epithelioma, and ordinary varicose ulcers.

The tubercles of *lepra,* however, are slower in growth, larger in size, and more chronic in character. They are accompanied by more or less anesthesia, and are productive of extensive deformity.

*Lupus vulgaris* usually manifests itself early in life, while tubercular syphilis rarely appears before middle age. The tubercles of lupus are smaller, moreover, and softer than those of syphilis, and pursue a more chronic course. The ulceration in lupus is superficial, the discharge is scanty and serous, and the crusts are thin and reddish. In syphilis the ulceration is deep-seated, the discharge is copious and purulent, and the crusts are thick, and present a greenish, yellowish, or dark-brown appearance. The cicatrices also differ, being hard in lupus and soft in syphilis. In syphilis there is also a history of previous infection, and other symptoms of the disease are apparent.

In *epithelioma* there is ordinarily only one lesion, which is slow in growth, obstinate and painful in character. Its base, which bleeds at the slightest touch, is fungiform, or red and granular, and covered with a thin, sanguineous, or sero-purulent secretion. The age of the patient is also significant.

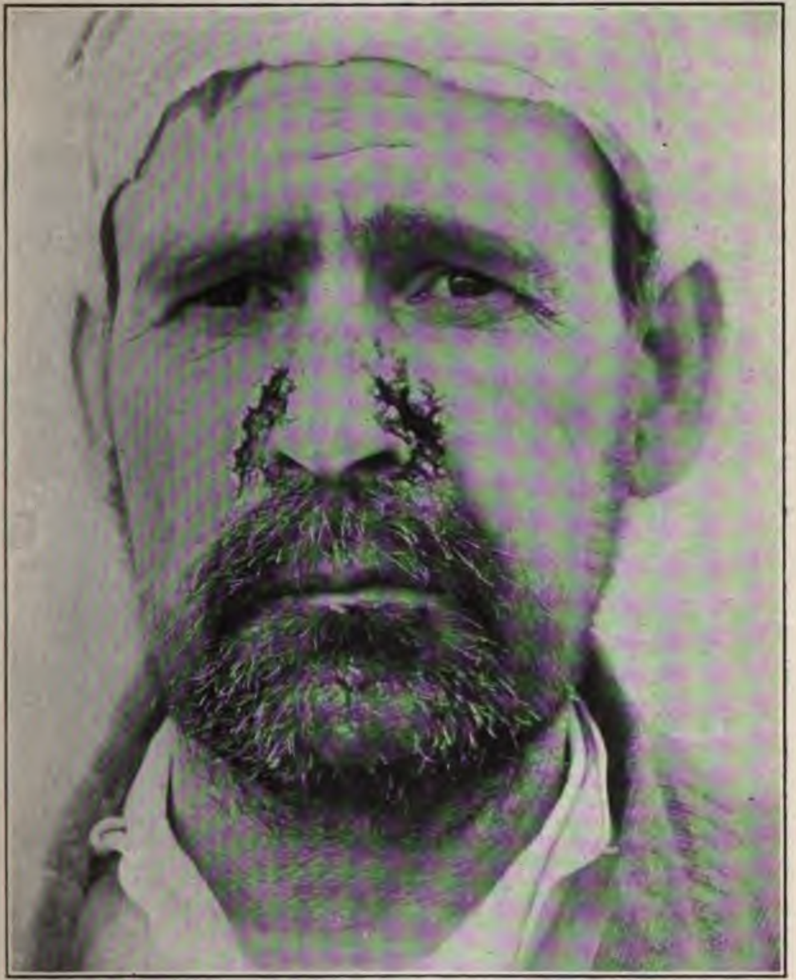
Ordinary *varicose ulcers* may be confounded with those which are due to the generation of syphilitic tubercles. The situation of the former, however, and their occurrence in persons who are compelled to stand for hours at a time, and the varicose condition of the surrounding veins, will point to a correct diagnosis.

## BULLOUS SYPHILIDE.

SYNONYM.—Pemphigus syphilitica.

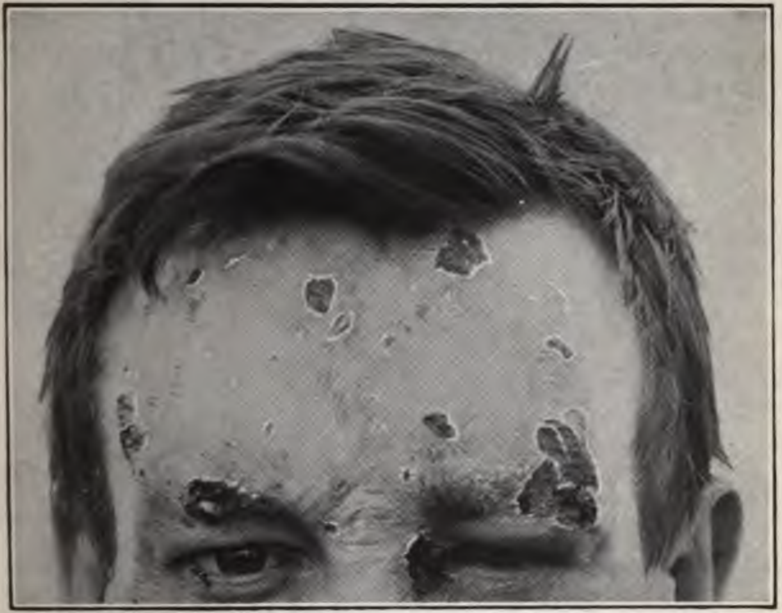
This eruption occurs only in debilitated individuals, in the advanced stages of the disease, and in infants who are the subjects of hereditary syphilis. It consists of a number of bullæ, or blebs, which vary in size

PLATE IX



Verrucous Syphilides. (See page 278)

PLATE X



Syphilis of the Frontal Bone. (See page 279)

from a small bean to a walnut. They are situated upon a reddened, infiltrated base, and are surrounded by a dark-red or coppery areola. They are firm to the touch at first, and filled with a clear, serous fluid, which becomes opaque in a few days. In some individuals the contents of the bullæ are purulent or bloody in character. In others the eruption is of a mixed nature, consisting of both bullæ and pustules. The eruption may appear upon any portion of the body, but is usually limited to the trunk and the extremities. After a variable time the bullæ rupture spontaneously, and the watery portion of their contents escapes. The remainder dries up into thick, yellowish, greenish, or brownish crusts, which vary in shape and size in accordance with the character of the ulcer upon which they are seated. The crusts of superficial indolent ulcers are flat and easily detached, while those of the deep-seated spreading variety are conical, stratified, and firmly adherent, forming the condition known as rupia. Rupial sores pursue a tedious course, and are always followed by the formation of permanent, depressed, round, oval, or kidney-shaped cicatrices.

**Diagnosis.**—The lesions of this form of syphilide present a superficial resemblance to those of pemphigus vulgaris. The latter, however, occur in successive crops, and are not followed by ulceration or cicatrices, and the crusts are thin and yellowish. The bullæ of syphilis are characterized by the rapid production of large, thick, pigmented crusts, and end in protracted ulceration and permanent cicatrization.

An unusual cutaneous alteration effected by syphilis has been described by Dr. Coulhon under the title of wasting, secondary syphilide, or abdominal streaks. The lesion begins in the form of small, linear, violaceous patches in certain situations. These patches disappear after a while, leaving behind them white lines similar to those observed upon the abdomen of pregnant women, but differing from the latter in beginning as violaceous spots and in their symmetrical arrangement. They are not regarded as characteristic of syphilis, but as evidence of profoundly disturbed nutrition of the integument.[1]

### GUMMATOUS SYPHILIDE.

Gummata at first form one or more circumscribed tumors or nodes in the subcutaneous connective tissue. They commence as small, round, firm nodules, which can be slightly moved beneath the epidermis. They are painless to the touch, but are usually accompanied by nocturnal osteocopic pains. When first observed they are about the size of a split pea. They slowly increase in diameter, by the deposition of additional material, until they attain the dimensions of a chestnut or a walnut. There are two varieties, the superficial and the deep-seated. The super-

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[1] New York Medical Journal, March 8, 1890.

ficial form visible tumors, which project above the surrounding s
The overlying epidermis is normal in color at first, but finally b
pinkish or reddish in hue. The deep-seated are situated in the loose
between the skin and the muscles, and rarely project above the s
They can be plainly felt, however, and outlined by the fingers as fir
or oblong tumors. They are rarely seen before the second or third
the disease, and may not occur until a much later period. Gumm
liable to appear upon any portion of the body, but are more often m
in those regions where the subcutaneous connective tissue is abund
on the buttocks, the abdomen, the sides of the neck and thorax,
the flexor surfaces of the extremities. They are seldom observe
the palms or soles; are usually single, but may be multiple. The n
present at one time, however, is scarcely ever more than three o
Gummata attain their maximum in about two months. They then
stationary for a period, after which they become soft and fluctuatin
disappear by absorption or ulceration. When the latter is about t
place, the gumma becomes slightly painful or tender, the skin burst
the centre of the lesion, and a small quantity of semi-purulent or
streaked material oozes out. The morbid process continues un
excavated ulcer as large as or larger than the original lesion is formed
base is uneven and covered with a yellowish or reddish aplastic de
Its sides are usually steep, but may be undermined or sloping. The
pursues a protracted course, and may extend to the underlying struc
producing great destruction of tissue. Healing finally occurs by gr
tion, with a white depressed cicatrix.

**Diagnosis.**—The diagnosis of gummata is usually self-evident.
might be mistaken for small *fibrous* or *fatty tumors* but the history
case, the situation of the lesions, the nocturnal osteocopic pains, and
symptoms of the disease, will prevent an error from being
Gummatous ulcers can readily be distinguished from *varicose ulcers* b
history of the case, the character of the secretion, absence of pain
existence of other syphilitic lesions.

Syphilitic paronychia, onychia, and alopecia are described unde
affections of the nails and hair, in another part of this book.
syphilitic affections of the viscera, and of the osseous, muscular, fib
and nervous systems, cannot be even briefly mentioned in this a
without expanding it far beyond the space to which it is limited.
consideration, moreover, properly belongs to a work on syphilis alone
is sufficient to say that there is not a tissue or a portion of the body
may not be invaded by this ubiquitous omnipresent disease, and that
baffling or obscure cases may frequently be relieved by appropriate me
when the possibility of their being of a syphilitic origin is recognized.

It should not be forgotten, however, that visceral syphilis may
at an early period of the secondary stage; and, indeed, I believe tha

happens more often than is commonly supposed. Jullien[1] has described a unique complication which was observed four months after the appearance of a chancre. A painless, smooth, indistinctly lobulated swelling occupied the helix, antihelix, and fossa of the antihelix. The reporter denominates it a "lymphochondric syphiloma."

Syphilis has a number of dermatoses following in its wake, which are not in themselves specific and are not influenced by antisyphilitic treatment. These eruptions are caused by the lowered vitality of the skin due to the syphilitic poison, but have no direct relation to the latter. Among these complementary dermatoses is acne and the peculiar and rare affection of the sweat-glands, known as hydradenitis destruens suppurativa. Seborrhea, especially of the dry variety, may also be excited by syphilis. An obstinate variety of eczema, the ischio-rectal eczema Madidans rubrum, affecting the perineum and adjacent regions, is described in this connection by Noah E. Aronstam, of Detroit. Dermatitis of the gangrenous variety and malignant erysipelas may be met with in patients suffering with constitutional syphilis; while herpes of the lips or genitals, and urticaria are among the less serious phenomena attending this condition.

**Diagnosis of Syphilis by Serum.**—Dr. Fleischmann[2] reports in 89 cases of syphilis with manifest symptoms, the Bordet-Gengon reaction, a positive result was obtained; in 64 patients known to be syphilitic but not showing manifest symptoms, the reaction was positive in 52 per cent., and in 38 cases of non-syphilitic persons it was negative. A positive reaction, he adds, might be regarded as a certain proof that the patient was syphilitic. The result of the reaction might, moreover, be of value in deciding whether anti-syphilitic treatment was indicated or not. Dr. Blaschko gives a summary of 400 cases examined by himself and Dr. Julius Citron. In no instance did non-syphilitic patients suffering from eczema, psoriasis, balanitis, herpes, and cancer give a positive reaction. In some doubtful instances the result of the reaction, whether positive or negative, was always verified by the further development of the case. Observations made on 300 syphilitic patients gave the following results. During the primary stage the reaction was positive in 90 per cent.; during the secondary stage attended with obvious symptoms it was positive in 98 per cent.; during the secondary stage without characteristic symptoms it was positive in 80 per cent.; during the tertiary stage with obvious symptoms it was positive in 91 per cent.; and during the tertiary stage without characteristic symptoms it was positive in 57 per cent. Professor Neisser[3] likewise states he is convinced that the serum diagnosis is useful and affords a reliable test of complete cure.

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[1] Annales de Dermatologie et Syphililogie, February, 1889.

[2] "The Serum Diagnosis of Syphilis." A series of papers and discussion at Berlin, Medical Society, February 19 and 26, and March 4, 1908; The London Lancet, March 28, 1908, page 971 and 972.

[3] British Medical Journal, January 11, 1908.

**Pathology of Syphilis.**—The pathology of syphilis has been thoroughly investigated by Auspitz, Biesiadecki, Kaposi, Neumann, Otis, and others, and may be said, in brief, to consist of local cell-proliferation, and an accumulation or infiltration of small, round cells, under the stimulation of the presence of the *spironema pallidum* and its toxins. Kraus[1] in recent investigations states that he found the organism in smears from condylomata lata twenty-three times out of thirty-one cases. He also observes the spirochete in semen of men affected with secondary syphilis. He was unable to find the organism in gummata. He found the organism in the bullous contents, lungs, liver, kidney, pancreas, testicles, and thymus of hereditary syphilitics.

Forty-eight examinations of non-syphilitic diseases revealed the presence of spirochete refrangens but no spirochete pallidum. The induration of the initial lesion is produced by infiltration of the papillæ of the corium and the subcutaneous connective tissue with small round, nucleated cells composed of finely granular protoplasm. They not only fill up the interstices of the corium and subcutaneous connective tissue, but penetrate into and through the walls of the cutaneous vessels, increasing their size but lessening their calibre. The ulceration which finally occurs is due to the interference in nutrition produced by the increased pressure upon the minute arterioles. The glandular complications of syphilis are produced by the same spirochete micro-organism, and similar cellular multiplication.

The macular syphilide is characterized by similar round-cell infiltration in the papillæ of the corium, and around and within the walls of the papillary vessels.

The papular lesions are due to a circumscribed, dense, round-cell infiltration in the papillary and sub-papillary layers of the corium, and in the upper portions of the subcutaneous connective tissue. The depth and extent of the infiltration correspond with the size of the papules. The mucous patches or moist papules are preceded by a similar process in the superficial portion of the corium. The papillæ are enlarged and branched or club-shaped, and the papillary vessels are swollen and tortuous. The tubercles and gummata consist of masses of closely packed round cells, which surround and penetrate all the cutaneous structures, and finally, by their increasing pressure, obliterate the capillaries, and produce atrophy and ulceration of the affected structures.

The pustular lesions are preceded by round-cell infiltration of the corium and its vessels, but more or less exudation and migration of leucocytes also take place. When absorption occurs the exudation is carried away through the lymph-spaces. In the vesicular and bullous lesions, the exudation of serum is so large, that it produces edema of the adjacent tissues. The characteristic round-cell infiltration is also present. The various lesions of the muscular, fibrous, osseous, and nervous systems, and of the internal organs, are also due to infection, cellular proliferation and infiltration.

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[1] Archiv für Dermatologie und Syphilis, vol. 3, p. 89.

The gumma consists of an accumulation of embryonic cells. It grows at its periphery, while its central portion undergoes retrograde metamorphosis. According to the histological researches of Marfan and Toupet, the gumma originates around small blood-vessels, which become surrounded by a mass of round cells intermixed with fibrillated tissue forming a coarse reticulum. Thus arises a nodule or sclerosed area. The larger vessel which supplies this area likewise suffers alterations of its outer and inner tunics. The calibre of the vessel is progressively narrowed. Obliteration of the vessel is followed by degeneration of the central portion of the nodule.

**Etiology of Syphilis.**—Syphilis is due to the entrance into the system of the specific virus which is contained in the blood of syphilitic subjects, and in the secretions of syphilitic lesions, and is known as the virus of syphilis. The specific agent has been shown by Schaudinn to be a form of spirillum or spirochete to which the name of *spironema pallidum* or *treponema pallidum* has been given.

That the virus may infect the system through an unbroken surface by absorption after long contact, is probable, but an abrasion or some other breach of continuity of the surface is generally necessary. The virus enters the circulation through the medium of the lymphatic system. It first produces a low grade of inflammation and cell-proliferation in the walls of the lymphatic vessels at the point of contagion. These cells become infected by the spironema or treponema pallidum of Schaudinn and are detached from the vessel-walls and convey it to the lymphatic glands. The micro-organisms of treponema pallidum of Schaudinn or their spores, or immature forms, then enter the thoracic duct, and, after mingling with the general blood-current, are carried to the various tissues of the body.

Risking superfluous mention, I may remark that syphilis can be communicated by direct or indirect contact, or by hereditary transmission. The most ordinary method is by sexual intercourse with one similarly diseased, especially if ulcerating lesions are locally present. It may be contracted, however, in a variety of other ways. Gynecologists and accoucheurs have been infected through an abrasion of the fingers while making a vaginal examination. The disease has not infrequently been communicated by infected instruments in the use of urethral sounds, or catheterization of the Eustachian tubes. The dentist is in danger of acquiring syphilis from contact with lesions or secretions of the mouth. On the other hand, dental instruments may serve to convey the virus from one patient to another, smokers likewise may become infected by using the pipe or cigar of a syphilitic friend. Surgical instruments have also been the medium of spreading the disease. Reports are made from time to time of the outbreak of syphilis in consequence of tattooing, the operator suffering from mucous patches and moistening the needle or colors with his saliva. A number of cases of this nature were under the care of the late Dr. F. F. Maury in the Philadelphia Hospital in 1877. A similar observation had been made in 1876 by Albert Josias.[1] In 1885, a man was arrested in the neighborhood of this city for the same offence. In the "British Medical Journal" of May 4, 1889, Surgeon F. R. Barker, of the British Army, communicates the histories of twelve soldiers who had been infected in the same manner; while in the issue of September 14, 1889, of the same journal, Surgeon Whitehead alludes briefly to five soldiers syphilized by tattooing at Landour, India. Three soliders (Jenny: Deutsche Militarärztliche Zeitschrift.) tattooed by a comrade on the forearm reported three months later for treatment. Each had a well formed chancre on the place of tattoo, enlargement of the axillary glands and roseolar eruption. Syphilis may be contracted by kissing a person whose mouth is the subject of mucous patches, or by suckling a syphilitic child, or by using the towels, sponges, cups, knives, forks, spoons, or other utensils which have been used by diseased persons.

Robert W. Taylor,[2] New York, describes a case of syphilis occurring while the patient was undergoing massage treatment from an operator who had mucous patches in his mouth, and who slobbered and wiped the saliva away from his mouth with his hands. Some benign papules became inoculated by this saliva and produced initial lesions which were followed by a typical attack of syphilis.

Cases are on record in which it has been transmitted by a bite. A patient brought before the Berlin Medical Society has been bitten by a man upon the lip. Though the wound healed in two or three days, in six weeks it reopened and the lip became greatly swollen. Five weeks later the inner surface of the lip was the site of an ulcer which was surrounded by great swelling and induration. The submaxillary and cervical glands were much enlarged and in time a typical syphilitic eruption developed.[3] A similar case is reported by Dr. Tchagin,[4] while others have been reported by Dr. Sturgis and Mr. Bryant. In fact, this method of transmission was noticed by Sir Everard Home, in his addition to John Hunter's well-known Treatise on Venereal Disease.

Follet[5] recently called attention to the number of cases of syphilis arising from contact with glass blower's pipes, gummed paper moistened with saliva and stuck on wounds, and mouth-pieces of musical instruments. He examined the saliva from untreated cases with chancres several months old, and he found it abounding with spirilla some of which may not have been treponema pallidum. This is in marked contrast with the saliva of healthy persons in which there are few spiral forms and these could not be confused with the treponema.

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[1] Le Progrès Médical, 1877, p. 205.
[2] Medical Record, October 12, 1907.
[3] British Medical Journal, September 27, 1890.
[4] Provincial Medical Journal, March 2, 1891.
[5] Biological Society, Paris, April, 1907.

Syphilis may also be conveyed through vaccination by employing the lymph, or scabs, taken from syphilitic subjects. Washerwomen may become infected through abrasions of the fingers while washing clothing stained with syphilitic discharges. Prof. Fournier concludes that out of 887 women treated by him for syphilis in private practice, no less than twenty-four per cent. had acquired the disease in some non-venereal manner. This is called *syphilis insontium*, or "syphilis of the innocent."

Chancre of the eyelid has occurred in infants in consequence of the mother or nurse washing the eyes with spittle. Physicians have occasionally contracted syphilis from the accidental projection of infected saliva upon the eyelid. Chancre of the face has been caused by a cut of a razor in shaving or rubbing the face with infected fingers, thus inoculating an abrasion.

Fournier mentions a case in which the operation of skin-grafting was followed by the development of a chancre in the cicatricial tissue.

The possibility of its transmission through the seminal fluid alone is denied by the most eminent authorities. Otis formulated the maxim, that in order to infect the embryo, the organism of the mother must first be involved. This doctrine was, nevertheless, strenuously opposed by Prof. Fournier, who cited a number of arguments to support the view that syphilis may be communicated directly from either parent. Syphilitic children are frequently born of syphilitic fathers and mothers, who are healthy at least in appearance. Of 103 pregnancies in previously perfectly healthy women, but whose husbands were syphilitic, forty-one, or thirty per cent., terminated in abortion or premature labor. A father who, prior to treatment, had transmitted the disease to his child, is capable, after a course of antisyphilitic treatment, of begetting healthy offspring. In "conceptional syphilis," to use the phrase of Prof. Fournier, a previously healthy woman impregnated by a syphilitic father, acquires syphilis during her pregnancy, although the father presents no actual lesion capable of directly communicating contagion. Disease inherited from the mother, however, is more disastrous to the offspring than when thus communicated solely by the father. According to Fournier, twenty per cent. of the children die when the father is syphilitic, sixty per cent. when the mother is diseased, and sixty-eight per cent. when both suffer.

Syphilis may appear in the second generation in a virulent form. The children and grandchildren of syphilitics are rarely entirely free from signs of the disease. The stigmata, or characteristic lesions, seem to be about the same for the second as for the first generation of inherited syphilis.[1]

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[1] Imparati. Gazetta degli Ospedali, Milan, 1907.

**Treatment of Syphilis.**—The plan of treatment most effective in syphilis is that which is directed to secure the elimination of the virus from the system, to prevent the development of complications, and to preserve the general health of the patient. It consists in the adoption of suitable hygienic measures, the internal administration of tonics, eliminative and specific medicines, and the external application of protective, stimulating, or specific remedies; but success can be obtained only by perseverance in the effort to eradicate the poison for a period varying from eighteen months to four years. Möller[1] makes a point of investigating the source of the infection in every case of syphilis, whenever possible, and has found this a great aid in general prophylaxis of venereal disease; when the source is discovered and the syphilis treated, further infection of others is less liable.

After the appearance of the chancre, there is no abortive treatment for syphilis. It may sometimes be advisable to excise or cauterize the initial lesion in order to allay the patient's anxiety, or to hasten the disappearance of the lesion; but the germs of the disease are in the system, and secondary symptoms will appear sooner or later. The initial sclerosis may be very effectually destroyed by the use of the galvano-cautery.

A new plan designed to avert the evolution of the secondary stage has been proposed by Dr. Bronson, of New York. This method rests upon the belief that, during the primary period, syphilis is only a local disease, and its author thinks it possible to prevent extension of the virus beyond the primarily affected ganglia. Prophylaxis is to consist in a series of hypodermic injections of corrosive sublimate beneath the initial lesion and into the mass of the indurated glands, or, indeed, into the entire district whose lymphatic vessels tend toward the diseased glands.[2] In objection to this scheme it may be urged that the most powerful considerations warrant the conviction that in primary syphilis the system is already, in fact, contaminated; that the initial lesion with its connected glandular involvement is but the first manifestation of one general indivisible process. Again, the hope of being able to destroy *in situ*, or in its course of transit, the infectious virus by a series, howsoever multiplied, of injections, is, in view of the rich abundance of lymph-conduits, nothing less than chimerical.

Jullien thinks that if the primary lesion be excised at a very early period, before involvement of the lymphatic vessels and glands, the development of constitutional symptoms may be checked. Ordinarily, however, it will be sufficient to direct the patient to apply a small quantity of mercurial ointment to the sore two or three times a day, or, to use the official black-wash or yellow-wash night and morning. If the chancre assume a sluggish, ulcerative character, it may be induced to heal rapidly by dusting its surface, twice daily, with a powder composed of one part of calomel and seven parts of bismuth subnitrate. Another effective application consists of equal parts of bismuth subnitrate and powdered cinchona-bark. The subiodide and the sub-gallate of bismuth, and thymol iodide are likewise excellent dusting-powders. Iodoform is invaluable, but its odor is offensive, and precludes its use except in hospital practice. The odor may be modified or partially suppressed by mixture with balsam of Peru, Tonka bean, naphthalin, creolin, recently ground coffee, and other substances[1] which may be used for this purpose, if the condition of the sore furnishes no contra-indication. A modification, known as odorless iodoform, is now supplied by Johnson and Johnson, which retains the physical characters of the remedy except the objectionable odor. Iodol is an excellent substitute for iodoform, and can be applied alone or combined with another powder, or in the form of an ointment. Europhen is also reported to be of service. A one-per-cent. solution of osmic acid has sometimes proved a useful topical remedy in the case of tubercular syphilide. Salol is of service in chancres attended with ulceration. It may be used as a powder weakened by a mixture with starch or some other inert substance, or it may be incorporated into an ointment. Other substances which may be beneficially applied to open chancres are: resorcin, one or two drachms (4 to 8 gm.) to the ounce (32 gm.) of suitable excipient; ichthyol ointment of about the same strength. Chancres indisposed to heal may be stimulated by the ointment of nitrate of mercury (much diluted), red oxide of mercury, or by naphthalin, one-half drachm or more to the ounce. The official mercurial ointment or plaster proves very efficacious in removing the characteristic sclerosis. Powdered benzoate of bismuth is an excellent dressing to ulcerated chancres. Betanaphthol in powder, either alone or mixed with subnitrate of bismuth, or made into an ointment, is likewise serviceable.

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[1] "Contagiousness of Syphilis." (Syfilis smittsamhet.) Hygiea, Stockholm, January, lxx, No. 1, pp. 1-96. M. Möller.

[2] Journal of Cutaneous and Genito-Urinary Diseases, June, 1888, p. 231.

Good results are obtained from the use of stimulating or astringent lotions. The following are especially valuable:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. corrosiv. | gr. ij. | 0.12 |
| Chloral. hydratis | gr. v. | 0.30 |
| Aquæ | f℥ij. | 64. |

M. Sig.: Apply externally.

| | | |
|---|---|---|
| ℞ Zinci chloridi | gr. j. | 0.06 |
| Acidi hydrochlorici dilut. | fʒj. | 4. |
| Aquæ | f℥j. | 32. |

M. Sig.: Apply externally.

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[1] See Author's "Materia Medica and Therapeutics," with especial reference to the Clinical Application of Drugs. Seventh Edition, pp. 555 and 562.

The sulphate of copper in the strength of five grains (0.30 gm.) to the ounce (32 gm.) of water, with or without the addition of a small quantity of Sydenham's laudanum, is a useful lotion for ulcerations. Dr. Willard Parker Worster treats the primary lesion, successfully by spraying it with a fifteen-volume solution of hydrogen dioxide at sixty pounds' pressure, subsequently dressing the sore with iodol. If the ulceration should extend widely and deeply, and become phagedenic, its entire surface should be thoroughly cauterized with fuming nitric acid, or the actual cautery. When cauterization is performed for moral effect or prudential reasons, any form of caustic may be employed, but the galvano-cautery is preferable. Its action is instantaneous, and limited to the lesion; the pain which it produces is momentary, and the resulting cicatrix is usually slight. As a rule, the less irritation to which a chancre is subjected the sooner will it disappear, and the smaller will be the cicatrix. The internal treatment of chancre is that of the disease of which it is the first manifestation, and should be commenced as soon as the diagnosis is made.

Preventive Treatment.—Metchnikoff and Roux, of the Pasteur Institute in Paris, have shown by experiments upon monkeys (which have been repeated successfully upon man), that after the virus has been brought in contact with a cut or abrasion, even though several hours have passed since the inoculation, the infectious material can be destroyed by rubbing in calomel ointment (20 per cent.). Therefore, any lesion after an impure intercourse or which has been exposed to infection, should be vigorously rubbed with calomel ointment and this also applied as a dressing in the hope of preventing systemic infection. Vorberg,[1] on the other hand, has collected from various society proceedings a number of cases of the prophylactic use of Metchnikoff's calomel salve with unsuccessful results, although applied strictly according to directions.

Hygienic Treatment.—As syphilis is pre-eminently a disease of degeneration, the patient should be placed under the best possible influences to resist its debilitating tendencies. He should be warmly clothed, and live as much as possible in the fresh air and sunlight, his diet should be nourishing and easily digested, consisting largely of meat, milk, and vegetables; tobacco and alcoholic drinks should be prohibited altogether, and excesses of all kinds avoided. The functions of the skin, kidneys, and bowels should not be permitted to become disordered, and at least eight hours out of the twenty-four are to be given to sleep. Bathing in lukewarm water two or three times a week is essential. The addition of sulphide of potassium to the bath enhances its effect. The patient must be cautioned against thinking about his disease, and be urged to cultivate an even, cheerful frame of mind. There is no malady more distressing or more difficult to cure than syphilophobia, which may lead to suicide or end in chronic insanity.

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[1] "Failure of Calomel Salve to Protect against Syphilis." G. Vorberg. Medizinische Klinik, Berlin. June 7, 1908, iv., No. 28. pp. 855-894.

E. H. Douty, Lausanne, Switzerland, believes that fresh air heightens metabolism and raises all the tissues to their highest point of resistance to the poisons constantly carried about by the circulating blood. He believes that open air, rest, high feeding, graduated exercise, and if possible a bright, dry, bracing climate, which are our means for enabling a patient to escape the terrors of consumption are just as important in enabling an individual to escape the eventual horrors of syphilis, with the help of small doses of mercury maintained for many years. Upon inquiry among the various sanatoria and hospitals on the continent, it was ascertained that the proportion of syphilitics among the phthisical men varies from 30 to 40 per cent., and in two instances it has been placed as high as 50 per cent. In many cases as soon as the open-air treatment is begun for the tubercular condition, the syphilitic symptoms very rapidly improve as well. If the syphilitic patient could devote one or two years to an open-air life, Douty claims we should not have the 30 per cent. of men syphilitic phthisical patients, and the millions of lives which tuberculosis at present costs would also be very much reduced.

TONIC TREATMENT.—Tonic remedies are always useful, and frequently indispensable, in enabling the system to withstand the ravages of syphilis. In some cases their employment is of even more service than the administration of mercurials and iodides. In these cases, small doses of mercury (0.0006 gm. or gr. $\frac{1}{100}$), given three times a day exerts a tonic effect, as pointed out by Keyes. It may be given in solution with gentian or cinchona, or in tablet form. Iron, especially in the form of the chloride and the sulphate, will almost always be found beneficial. Its value is due to the fact that its presence in the system increases the number of red corpuscles in the blood, thus counteracting in part the destructive influence exerted by the disease. Codliver oil, arsenic, quinine, strychnine, the mineral acids, and the bitter tonics, may also be given with decided advantage. In depressed conditions of the system the chlorate of potassium will be found of decided utility.

Lenzmann[1] has revived the treatment of syphilis with quinine, modeling it on the dosage of arsenic in trypanosome affections. He injects 7½ grains (0.50) quinine hydrochloride and repeats this dose the next day, then injects 9 grains (0.60) and repeats this latter injection four times at four-day intervals. By the ninth intravenous injection all symptoms had vanished in his cases. In order to obtain the beneficial action of hyperleucocytosis he makes additional injections of a mixture of 40 parts nucleinic acid and 60 parts quinine, one part of this mixture being suspended in 20 parts of olive oil; 10 c.c. of the suspension is the dose for intra-muscular injection. His experience with fourteen patients has demonstrated to his satisfaction—as he describes in detail—the prompt curative action of the quinine. Whether the cure will be permanent or not, time alone will show. This technic, he says, may prove useful in cases in which mercury fails or is not tolerated. As a rule he uses from 4.5 to 5.5 gm. (67.82 grains) of quinine hydrochloride in the course of from fourteen to twenty days.

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[1] "Intravenous Injections of Quinine in Syphilis." (Eine neue Behandlungsmethode der Syphilis.) R. Lenzmann. Deutsche medizinische Wochenschrift, Berlin, March 5, xxxiv, No. 10, pp. 401-448.

ELIMINATIVE TREATMENT.—The elimination from the system of the products of degeneration and waste is secured in part by attention to the functions and hygiene of the patient, and in part by the action of the special remedies. Marked benefit can be obtained in addition, however, by the use, as adjuvants to the mercurials and iodides of agents that promote destructive metamorphosis, and increase the action of the various secretory organs of the body. Antimony, sarsaparilla, guaiac, stillingia and sanguinaria are the most important of this class. The reputed efficacy of ephedra, or Mormon tea, has been investigated by Dr. H. H. Rusby, who concludes that its depurative action is second only to that of iodide of potassium, with which it may therefore be advantageously alternated or combined.[1] The fluid extract of clover is used as a vehicle for potassium iodide in a compound syrup that is much used. The elixir stillingia compositum (N.F.), contains stillingia, corydalis, iris, sambucus, chimaphila, coriander and xanthoxylum berries, is a useful alterative.

SPECIFIC TREATMENT.—The specific treatment of syphilis consists in the administration of mercury during the early stages of the disease, and iodide of potassium, either alone or combined with mercury, during the later stages. This is the treatment *par excellence* of syphilis, and the only one which can be relied upon to eradicate the virus from the system and prevent a return of the disease. It can be assisted by the simultaneous employment of hygienic, tonic, and eliminative measures, above mentioned; but without it for a basis they are of comparatively little value. The manner in which the curative influence of mercury and potassium iodide is exerted in syphilis is not known. It is probable, however, that they act in part as eliminative agents, and in part as direct antagonists of the spironema pallidum or the treponema pallidum of Schaudinn. They also assist indirectly by stimulating metabolism, or the processes of cell proliferation and degeneration.

This course, however, should never be followed as a mere matter of routine, but be from time to time intermitted and replaced by a tonic regimen. An important part of the treatment is to overcome the tendency to anemia and cachexia and this should always be done, before giving mercurials. Leloir has pointed out that a too rigid reliance upon specific treatment induces a condition of neurasthenia with dilatation of the stomach, simulating severe cerebral syphilis. In such cases it is a serious mistake to continue or increase the doses of specific drugs, as this serves only to aggravate the manifestations.

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[1] Druggists' Bulletin, 1888, p. 220.

A. F. Price,[1] Medical Director U. S. Army, after an experience of thirty-five years in the treatment of syphilis in the navy, has come to the conclusion that the use of copper is of value as an addition to the accepted treatment and that it has some peculiarities that are of great interest and command attention. The most important of these is an intolerance of the copper salt, which, when it exists, is characteristic of old syphilis. There is no other disease in which there is such extreme sensitiveness to copper, and this fact is often of diagnostic aid. The experience of many years in the use of this agent had led the author to formulate his belief as follows: (1) The treatment of syphilis in all its stages inclusive of the cachectic and the parasyphilitic forms, is well founded on sulphate of copper in the average dose of $\frac{1}{30}$ gr., aided by such quantity of blue mass as is borne readily by the patient. (2) In old syphilis in any form the copper salt must be given in minute doses and gradually increased as tolerance is established, until the usual dose of $\frac{1}{30}$ gr. is given, when the mercurial should be added in rather small doses. It is sometimes better to give the medicine only on alternate days. (3) In acute syphilis the copper salt is to be given in the dose of $\frac{1}{30}$ gr. and the mercurial added at once and increased as much as the patient will tolerate, in order that the disease shall be neutralized and eliminated as completely as possible. (4) Iodin, iron, arsenic, and tonics of any sort, while useful, occupy a subordinate place in the treatment of syphilis. (5) Alcohol, and especially tobacco, should be forbidden to syphilitics. A number of cases are reported, which illustrate the benefit resulting from this method of treatment in old cachectic and tabetic cases.

General Medicinal Treatment of Early Syphilis.—The general medicinal treatment of syphilis may be appropriately divided into that of the early and the late manifestations of the disease. The primary and secondary lesions are included in the former class, and the tertiary and quaternary in the latter. Mercury is by far the best remedy, in both the primary and secondary stages, and it should be employed as soon as the diagnosis is made. Nothing can be gained, and much may be lost by deferring its use until secondary symptoms have appeared. The advocates of delay admit that the early administration of mercury postpones or modifies the development of the cutaneous manifestations; but they urge that this delay, or modification, is of no ultimate benefit to the patient and also prevents the formation of an accurate prognosis. This claim is wholly erroneous, however; but even admitting the latter to be true, the welfare of the patient should not be endangered in the endeavor to make the physician a true prophet.

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[1] New York Medical Record, October 10, 1903.

At a meeting of the Medical Society of London, February 20, 1888, Jonathan Hutchinson read a paper on what he styles the "abortive treatment" of syphilis. Without insisting too strongly upon the literal accuracy of the term as indicating absolute annihilation of the disease, he believed that it may be fairly used as a treatment which is planned to prevent secondary phenomena and which usually succeeds. If a patient with indurated chancre, and no other symptom, be at once placed upon a mercurial course and continued for at least six months, the experience of Mr. Hutchinson has been that secondary symptoms will not make their appearance. His choice as a remedy is the gray powder administered in one-grain (0.06 gm.) doses three times a day at least. The induration will generally soften rapidly within a week. If the treatment be given up at the end of six months, a general erythematous rash often develops within a few weeks. This eruption never becomes papular or scaly, and disappears after a few days' return to the mercurial treatment. For this reason, he regards it as judicious to continue the treatment for nine or twelve months. He does not affirm, however, as I understand it, that this method will entirely prevent the occurrence of tertiary symptoms. Though I do not feel justified in going so far as to assert that the skin and throat symptoms of syphilis can always be suppressed by the administration of mercury in the primary stage, I am positive that these symptoms are so remarkably ameliorated by this procedure as to relieve the sufferer from much annoyance and alarm. Furthermore, though the virulence of the disease in the early period of constitutional involvement usually expends itself upon the skin and mucous membrane, the important fact should never be forgotten that lesions of the brain, spinal cord, liver, spleen, bone, and other structures not infrequently occur during the late so-called secondary stage. I am, indeed, of the opinion that visceral syphilis is much more common in the secondary stage than is usually supposed. On the other hand, Kaposi, of Vienna, believed that when constitutional treatment was begun before the outbreak of secondary symptoms, a predisposition to future involvement of the nervous system was created.

The beneficial effects of mercury in syphilis are attributed by Thalman[1] to its destructive action upon the spironema. Soon after infection, antibodies are formed, which may induce a high degree of immunity as in some cases to produce a spontaneous cure. But if this does not take place it never becomes high enough subsequently to overcome the parasites when the immunity diminishes; the few spironema remaining in the tissues rapidly multiply and produce the secondary roseola. Each eruption causes damage to the cells from the effects of the endotoxins, so that in tertiary syphilis only a few spironema are required to produce ulcerative changes in the already damaged tissue.

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[1] Munchener Medicinische Wochenschrift, March 26, 1907.

The increase of symptoms following the introduction of a mercurial treatment is due to the setting free of the endotoxin and its reactive effect on the tissues. On the other hand, iodide of potassium, acting by increasing the absorption of the inflammation products and of the poison itself, and leading to the excretion of the latter, limits or stops this reactive damage. Thalberg regards the secondary symptoms as most important, inasmuch as the effect of them is to so damage the tissue cells that they are easily affected during a later period. For this reason he considers it essential for successful treatment to employ a local and general mercurial treatment as soon as the spirochetes are found in a primary sore. He injects the perchloride of mercury under the sore, so that the spirochetes in this situation and between it and the glands may be destroyed. Since but few spirochetes are present at this stage, but little endotoxin will be set free, and therefore a high degree of immunity will not be achieved. In order to increase the artificial immunity, he prefers to carry this treatment out in interrupted stages. He has treated 34 men in this way within about fourteen months, of whom 33 were subjected to local and general treatment and 1 to local treatment alone at first. In all the 33 cases the treatment was begun before the secondary eruption had shown itself. In 17 he carried out a local application of calomel, in 16 he injected perchloride of mercury once or twice underneath the sore and also applied calomel, and in all he employed inunction. In a few he carried out his nasal mercurial application. In 7 cases, he was only able to watch the course for six months, and in none of them did he see any secondary rash; 8 of the remaining 24 were watched for over six months (up to fifteen months) and did not have secondary eruptions. He discusses the 8 cases briefly, and lays great stress on the fact that in all his cases *spirocheta pallida* was found before the treatment was begun. Although he realizes that it is extremely difficult to speak with certainty, he is inclined to regard the eight cases as cured, as no secondary eruption appeared after an early local and general treatment was carried out. Turning to the other cases, he finds that when secondary symptoms appear after the cases are treated in this way, the secondary signs differ in two respects from the usual secondary manifestations. In the first place, the eruption appears much earlier than usual, at times after six weeks, but never later than three months; and, secondly, the eruption is limited to much fewer and smaller areas than without treatment. He concludes by stating that 30 per cent. of the cases which he treated in this way did not show any secondary symptoms after six months, and the remaining cases showed symptoms which were localized to one or at most a few foci. He believes that the only rational treatment of syphilis is the early treatment.

Mercury can be introduced into the system by internal administration, inunction, fumigation, or hypodermic injection. The former metho usually adopted in the early stages of syphilis, as it is the most conven and possesses the fewest disadvantages.

Any of the preparations of mercury are useful, given alone c combination with any other remedies which may be indicated. preparations which I most frequently employ are the green iodide and corrosive chloride of mercury; but cases sometimes occur in which red iodide, the mild chloride, blue-mass, or mercury with chalk can be with more advantage. No matter what form of mercury is adopte should be given in small doses at first, in order to avoid the dang producing salivation at the beginning of treatment. The susceptibili its influence varies so much, that too great care can not be taken in respect.

Dr. Petersen has ascertained that the gums are peculiarly sensiti those patients whose kidneys are involved. A practical deduction this fact is that, whenever ptyalism occurs in a syphilitic patient, urine should immediately be examined. Before beginning a systen mercurial treatment, it is advised that the fact should be ascertained the kidneys are normal, and are functionating properly.

If the patient's general condition is fair, I usually begin by direc him to take one of the following pills, half an hour after each meal an bedtime:

| | | | |
|---|---|---|---|
| ℞ | Antimonii et potassii tart. | gr. ss. | 0.03 |
| | Hydrarg. iodidi viridis | gr. iij. | 0.18 |

M. Ft. pilulæ No. xxiv.

If they do not produce intestinal irritation or soreness of the gum I increase the green iodide until a fourth (0.015 gm.) or a third of a gra (0.02 gm.) is taken four times daily. At the end of the third week t tartar emetic may be discontinued, but the green iodide continued increased quantity without intermission for three or four months. I th stop it for one or two weeks, or reduce it to the one-sixteenth of a gra twice a day. During the intermission I generally place the patient up one of the following formulæ:

| | | | |
|---|---|---|---|
| ℞ | Strychninæ sulphatis | gr. ss. | 0.03 |
| | Potassii chloratis | ʒij. | 8. |
| | Acidi hydrochlorici dilut. | fʒj. | 4. |
| | Aquæ | f℥iij. | 96. |

M. Sig.: One teaspoonful in water after meals.

| | | | |
|---|---|---|---|
| ℞ | Tinct. belladonnæ foliorum | fʒjss. | 6. |
| | Tinct. ferri chlor. | f℥jss. | 48. |
| | Aquæ | f℥ijss. | 80. |

M. Sig.: One teaspoonful in water after meals.

| | | |
|---|---|---|
| ℞ Tinct. ignatiæ | fʒjss. | 6. |
| Tinct. serpentariæ | f℥ss. | 16. |
| Tinct. coptis trifoliæ | f℥ijss. | 80. |

M. Sig.: One teaspoonful in water before meals.

Erythroxylon coca was highly esteemed as a tonic adjuvant by the late Dr. R. W. Taylor, who administered it in the form of a reliable fluid extract, (which is now official as fluidextractum cocæ dose, 2-4 c.c. or fʒss-j). He frequently combined it with the compound tinctures of cinchona and gentian.

After one or two weeks of this simple tonic treatment, I renew the maximum doses of the mercurial for three or four months more. Another week of intermission then ensues, after which the mercurial is given for another protracted period, but in somewhat smaller doses. After this plan of treatment has been faithfully carried out for a year, the intermission may be lengthened to a month, and the periods during which the mercurial is continuously given reduced to six or eight weeks. If no lesions are manifest at the expiration of six months of this interrupted treatment, or a year and a half from the beginning of the disease, the mercurial is discontinued for two or three months, then administered in small doses for a week or two, and then dropped for two months more. If any lesions occur in the meantime, the treatment is resumed at once. If no eruption appears, however, the patient may be considered to be practically cured, but should be advised not to marry for at least one year after all symptoms of the disease have disappeared. By pursuing such a prolonged course of administration, Professor Fournier estimates that tertiary manifestations will be prevented in from ninety to ninety-five per cent. of the cases.

If the person be anemic or debilitated, a small quantity of iron, or of quinine, may be added to each pill, or given separately, as in either of the following formulæ:

| | | |
|---|---|---|
| ℞ Strychninæ sulphatis | gr. j. | 0.06 |
| Quininæ sulphatis | ʒss. | 2. |
| Acidi phosphorici dilut. | fʒij. | 8. |
| Aquæ | f℥iv. | 128. |

M. Sig.: One teaspoonful before meals.

| | | |
|---|---|---|
| ℞ Liq. potassii arsenitis | fʒj. | 4. |
| Elix. gentianæ et ferri phosphatis (N.F.). | f℥iij. | 96. |

M. Sig.: One teaspoonful after meals.

If the movements of the bowels exceed three a day, or griping, colicky pains occur, from a twelfth, to a fourth of a grain (0.005 to 0.015 gm.) of opium should be added to each pill. It may be necessary on this account, to discontinue the use of the mercurial for a few days. If salivation occur, or the gums become spongy, the mercurial must be stopped, and bella chlorate of potassium, and the mineral acids, given in full doses.

| | | |
|---|---|---|
| ℞ Acidi hydrochlorici dilut. | f℥ss. | 16. |
| Aquæ | f℥iv. | 128. |

M. Sig.: Dessertspoonful, in water, before meals and at be

| | | |
|---|---|---|
| ℞ Tinct. belladonnæ foliorum | fʒj. | 4. |
| Potassii chloratis | ʒij. | 8. |
| Aquæ | f℥iv. | 128. |

M. Sig.: Two teaspoonfuls, in water, one hour after meals.

In addition, the mouth should be thoroughly rinsed every two or hours with a weak solution of common salt, or what is better, chlor potassium, or a lotion composed of half an ounce (16 gm.) of com tincture of cinchona and six ounces (192 gm.) of rose-water. The ti of hydrastis, diluted with water, is also useful as a corrective mouth- Boroglycerid well diluted is also useful, or the official antiseptic soluti

The corrosive chloride of mercury is an effective remedy in syphilis. It is less irritating when given in solution. The doses vary in the beginning from the one-thirtieth to the one-twenty-fourt grain (0.002 to 0.0025 gm.), gradually increased to one-sixteenth or tenth of a grain (0.004 or 0.006 gm.) four times a day. In exceptional no impression is produced upon the disease until the dose has increased to the one-eighth of a grain (0.008 gm.). It may be giv cinnamon water, or in compound tincture of gentian. The perma of the aqueous solution may be insured by the addition of a small qua of the chloride of sodium, as in the following formulæ:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. corrosiv. | gr. j. | 0.06 |
| Sodii chloridi | ʒj. | 4. |
| Aquæ | f℥ijss. | 80. |

M. Sig.: One teaspoonful after meals and at bedtime.

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. corrosiv. | gr. j. | 0.06 |
| Sodii chloridi | ʒj. | 4. |
| Tinct. cinchonæ comp. | f℥ijss. | 80. |

M. Sig.: One teaspoonful four times a day.

In case the corrosive sublimate is not well borne, the substitution fo certain period of the chloride of gold and sodium has been found of adv tage. The dose of this double salt is from one-fiftieth to one-tenth o grain (0.001 to 0.006 gm.) three times a day. It is freely soluble in wat but is best administered in the form of a pill or tablet triturate. anemic or debilitated subjects the best results can usually be obtai from the combined administration of the corrosive chloride of mercury chloride of iron:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. corrosiv. | gr. j. | 0.06 |
| Tinct. ferri chlor. | f℥ss. | 16. |
| Aquæ | f℥iijss. | 80. |

M. Sig.: Dessertspoonful, in water, after meals and at bedtime.

The biniodide of mercury is highly esteemed by many practitioners. It may be given alone or combined with potassium iodide. The dose varies from the one-thirtieth to the one-twelfth of a grain (0.002 to 0.005 gm.). In exceptional instances, mercury has no power to alleviate violent headache. In these cases, the substitution of the iodide of potassium, alone or combined with bromide, may be of advantage, increasing the dose of the former rapidly until the point of tolerance is reached. In headache of the secondary period, not dependent upon serious cerebral lesion, Leroy has found aconitine serviceable. He administers the drug in minute doses. It can be given in from $\frac{1}{300}$ to $\frac{1}{250}$ grain (0.0002 to 0.00024 gm.) during the course of the twenty-four hours. The mild chloride is one of the best preparations of mercury that can be used in syphilis, but it must be administered with caution. Its action is so prompt that salivation is sometimes produced by it with startling rapidity. It is especially valuable where an immediate mercurial impression is desired, as in syphilitis iritis. It may be given in grain or half-grain (0.06 or 0.03 gm.) doses four times a day; but where prompt mercurialization is required, one-eighth of a grain (0.008 gm.) should be given every hour or two.

Blue mass is also valuable for internal use. It is slow in action but certain in results, and seldom produces gastric irritation. The dose varies from half a grain to two grains (0.03 to 0.12 gm.), four times daily. It is usually given in pill-form, and may be combined with iron, quinine, antimony, or opium, when necessary.

Hydrargyrum cum creta, or gray powder, is an effective and non-irritating preparation. The dose varies from one to three grains (0.06 to 0.18 gm.), four times daily. It may be given as a powder, or in pill-form, or combined with other remedies.

Several new mercurial combinations have, during the past few years, been introduced into practice. These have all in clinical experiments, proved themselves more or less efficacious in virtue of the mercury which they contain, but not any has as yet been able to supersede the older salts. Sufficient evidence has accumulated, however, to demonstrate the utility of the tannate of mercury. This is considered by Schwimmer to be more active than corrosive sublimate. It is not prone to cause alimentary disturbances, and can be continuously administered for a long time. The dose is one and one-half grain (0.09 gm.), twice or thrice daily either in pill or solution. Another very valuable salt, the neutral salicylate of mercury, was brought to the notice of the profession by Dr. Silva Aranjo. Favorable reports have been given of its action by various Brazilian physicians;

Szadek, of Kiev; Newman, of Vienna; W. C. Caldwell, of Chicago; Dr. A. F. Buchler, and others. The usual dose in which it is given is one-third to one-half grain (0.02 to 0.03 gm.), in pill or tablet, three times a day. The last-named writer[1] treated thirty-two cases of syphilis with this compound. He found it a prompt and efficient remedy, well borne by the gastro-intestinal tract and system at large. It is thought to resemble the yellow mercurous iodide of mercury more closely than any other salt, but is said to be better tolerated. Professor Schwimmer found this salt of value in seventy cases of constitutional syphilis, but states that it is apt to cause stomatitis. This writer administered it either in the form of powder or pill.

The benzoate of mercury, chiefly used hypodermically, has also been tested by Stukovenkoff as an internal medicament in the dose of one-tenth to one-third grain (0.006 to 0.02 gm.), in pill, twice daily. It was found to be slow in action, and in a number of cases it gave rise to diarrhea. This salt was also administered internally by Balzer and Thiroloix,[2] who substituted it for the biniodide in the syrup Gibert, as it readily dissolves in a solution of iodide of potassium. Though they confess that their experience had been insufficient for any decided expression of opinion, yet they found that the benzoate mixture was well borne by seven patients in whom Gibert's preparation excited immediate vomiting.

The anilarsenate of sodium (sodium aniline aresenate, or atoxyl) is at the present time very largely used in Europe in the treatment of syphilis. This is used hypodermically (in doses of 0.50 or gr. viij), but its use is not devoid of danger, as has been claimed. Lévy-Bing reported two cases in which toxic effects followed. He concluded that it is inefficacious in the course of syphilitic complication in the process of evolution and has no effect upon the acute anemia due to the spironema pallidum. Forneau claims that atoxyl is a monosodic salt of the anilide of orthoarsenic acid, and that it contains only 29 per cent. of arsenic instead of 37.69 per cent. claimed by the manufacturers. Hallopeau, while acknowledging the powerful action of this salt on the infectious agent, protests against its common name "atoxyl" as this is purely a fancy name and conveys an erroneous impression as the drug is toxic in a high degree. At a meeting of the Académie de Médecine, Dr. Hallopeau[3] made a further communication on the use of repeated and systematically localized injections of atoxyl at the beginning of syphilis, and their attenuating, retarding, and possibly abortive action on the disease.

Uhlenhuth and his co-workers assert that this drug, given in sufficiently large doses, has an unmistakable action on the manifestations of syphilis, especially striking in the malignant forms. The drug does not influence the movements of spirochetes in the test-tube, even in a 1 per cent. solution, but it seemed to banish the spirochetes from the blood completely in an infant with inherited syphilis, while no influence was apparent in another case of the kind. Six of the eleven syphilitics treated systematically with the drug exhibited symptoms of intoxication, loss of appetite and sleeplessness, accompanying severe colic-like pains or diarrhea, while one of the patients exhibited albuminuria, with casts and blood corpuscles in the urine. The return of these symptoms after resumption of the drug established its causal relation. The late Professor Lassar believed that this salt had a special field in the treatment of galloping syphilis. He also had seen albuminuria produced by its use, so due caution is necessary.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, May, 1890.

[2] *Loc. cit.*

[3] The British Medical Journal, January 18, 1908, p. 173.

The influence of heat with consequent free diaphoresis, is of decided benefit as an adjuvant to syphilitic medication. Dr. Radestock, of Geithain, in Saxony, is in the habit of ordering a hot bath, continued for about thirty minutes or until the skin becomes red. The action of the skin is promoted by hot decoctions or infusions or by the hypodermic injection of two cgm. (one-third grain) of hydrochloride of pilocarpine daily. A striking exemplification of the effect of heat upon cutaneous syphilis is the series of observations made by Dr. Kalashnikoff, of St. Petersburg. Partial hot-air baths were administered, to accessible affected parts, for half an hour twice a day. In the intervals the part was enveloped in hot flannel. The temperature never exceeded 116° Fahr. When the hot-air chamber could not be used, India-rubber hot-water bottles, or tubes through which hot water flowed, were employed. When both arms or legs were affected, the hot applications were made to the limb of but one side, in order to make comparison. The treatment was generally found to have a very favorable effect upon syphilitic eruptions, even when employed alone; and, in fact, was often beneficial where mercurials or iodides had failed.[1]

Robinson recommends, as an adjuvant, pilocarpine in the treatment of syphilis. He[2] states that in syphilis, particularly in those cases in which sufficient attention had not been paid to gastro-intestinal elimination, to hepatic, renal, and dermic activity, he tried a few doses of pilocarpine, and was astonished at the results. Most remarkable is the effect of pilocarpine on salivation and stomatitis. One might think it rather strange to administer a powerful sialagogue in salivation. But the fact remains that nothing will stop mercurial salivation so effectually as will small doses—say two milligrammes—of pilocarpine.

Robinson further adds, that the pilocarpine should never be prescribed in combination with other remedies—always alone. We can then increase or diminish the dose, or discontinue it altogether, at pleasure. This writer prescribes the alkaloidal salt either in the form of pills, containing two milligrammes each ($\frac{1}{32}$ grain), and of these he orders two pills three times a day, sometimes increasing to three or four pills per dose; or he prescribes it in the following solution:

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[1] Journal of Cutaneous and Genito-Urinary Diseases, July, 1890, p. 284.
[2] The Medical Record, New York, June 15, 1907.

℞ Pilocarpinæ hydrochlor. ........... 0.12 (2 grains).
Aquæ chloroformi ............... 120.0 (4 ounces).
Detur in vitro nigro. S.: Dose, ʒj to ℥ij t.i.d.

In not a single case has he observed any undesirable by-effects, and in no case could he find, though he carefully watched, symptoms of cardiac depression.

This author has careful notes of a rather considerable number of cases, in which the beneficial effects of pilocarpine were unmistakable.

Mercurial Inunction.—This is a rapid and effective method of bringing the system under the influence of mercury, and is especially useful in all cases where a speedy effect is desired, as in syphilitic iritis, syphilis of the nervous system, or of the internal organs. It is also serviceable in many old cases of the disease, and in those in which mercury will not be tolerated by the stomach. The difficulties and inconveniences attending its use are so great, however, that it is seldom ordered in private practice, except in the urgent cases previously referred to, and in some forms of hereditary syphilis.

The preparations employed in inunction are the ordinary blue ointment, and the oleate of mercury. The oleate of mercury, however, as I have already shown, is far superior to the ordinary blue ointment. It is a powerful remedy, which should be employed with caution. It possesses deep penetrating powers, and by its quick diffusion frequently produces a rapid constitutional impression. Its further advantages over the blue ointment are its cheapness, and cleanliness of application. A small piece about the size of a bean, rubbed in each axilla daily, and in the surface of each thigh, will be quickly absorbed, without soiling or discoloring the clothing; and while the friction may produce a reddening of the surface, the eczematous condition, which may follow the use of any mercurial ointment, can be avoided by having the patient take a vapor or a hot-air bath two or three times a week. An experience of several years has convinced me that frequent opening and cleansing of the follicles of the integument are necessary for the success of the inunction treatment; otherwise they will become clogged, an eczematous inflammation will be set up, and absorption rendered impossible.

Dr. O. Dymnicki, of Büsk, has contributed an excellent paper to the Polish weekly, "Gazeta Lekarska," No. 19, 1889, upon the advantage, in certain cases, of combining the internal administration of quinine with mercurial inunction. The quinine was given in the daily dose of one to one and a half grammes (fifteen and a half to twenty-three grains). His conclusions are drawn from the results in 178 consecutive cases. The patients in whom the conjoined use of quinine proved most beneficial were those having severe ulcerations, and whose temperature, pulse, and body-weight underwent considerable fluctuations. The value of the quinine appears to depend upon the inhibitory influence upon this tissue-change. As a consequence, the quinine supports the system and enables it to bear larger doses of mercury. Quinine proved useless in cases in which tissue-change was retarded. Bovero employs calomel inunction, from eight to fifteen grains (0.5 to 1 gm.) being made into an ointment with forty-five grains (3 gm.) of lanolin and fifteen grains (1 gm.) of cacao-butter. The administration of mercurial ointment by suppositories (1 gm. or gr. xv each) may be regarded as a modification of inunction treatment and is a rapid method of producing salivation, in cerebral syphilis and iritis.

Mercurial Fumigation.—This practically consists in placing the patient in a mercurial vapor-bath. It is valuable, but somewhat difficult to employ in private practice. The patient, completely stripped, is seated on a chair or stool, beneath which are a spirit-lamp, pan of water, and a tin containing mercury. A large blanket or rubber cloak is thrown around the patient, covering him from the neck downward. The lamp is lighted, and profuse perspiration is produced. The mercury becomes volatilized, and, deposited upon a thoroughly relaxed skin, is finally absorbed. The lamp should be removed in fifteen or twenty minutes, and the patient permitted to cool off gradually. Any form of mercury may be used in this method, but the mild chloride is most frequently employed, as it vaporizes promptly, and its fumes are not irritating. From twenty to thirty grains (1.30 to 2 gm.) are sufficient, and the process should be repeated two or three times a week. Mercurial fumigation is especially valuable in obstinate eruptions of the secondary or tertiary stage. It is also useful in all old cases of syphilis, and where the internal administration of mercury is productive of severe gastric disturbance. Its good effects are due in part to the increased elimination of morbid products by the skin, and in part to the rapid absorption of the finely divided particles of the remedy.

Mercurial Plaster.—M. Quinquaud, of Paris, has proposed a new method of treatment which consists in the application of a mercurial plaster over the spleen. The mass is prepared as follows:

| | | | |
|---|---|---|---|
| Diachylon plaster ................ | 60 | ounces | 1920. |
| Calomel ......................... | 20 | " | 640. |
| Castor-oil ....................... | 6 | " | 192. |

Mix, and make into plasters four inches square. After washing the skin with soap and water, a plaster is applied and left in position for eight days. It is then removed, and the skin is left free for eight days, when a second plaster is put on and allowed to remain eight days. After the first plaster has been in position for four or five days, mercury will begin to appear in the urine, and will gradually increase, reaching its maximum on the eighth to the eleventh day. If no second plaster be used, mercury will continue present in the urine for a month or six weeks. By discontinuing the use of the plaster every eighth day for an equal period, ptyalism is said to be entirely avoided. This is a convenient mode, and M. Quinquaud claims that the results are effective.

MERCURIALIZED TRAUMATICIN.—In some cases the method of Peroni, of Turin, may be employed as a convenient way of introducing mercury into the system. To traumaticin, which is a ten-per-cent. solution of gutta-percha in chloroform, Dr. Peroni adds a quarter of its weight of calomel. The patient is given a bath, and if there are any lesions, they are painted over with the liquid. If no lesions are present, the preparation is applied over the entire back. The evaporation of the chloroform leaves a closely adherent mercurial elastic varnish upon the skin. The treatment is repeated three times a week until the symptoms disappear.

HYPODERMIC INJECTION OF MERCURY.—The hypodermic administration[1] is the quickest and most effective method, and should be resorted to in all grave cases, and where prompt removal of the lesions is of importance. This method was introduced by Scarenzio, and improved and popularized by Lewin. Scarenzio employed injections of the mild chloride, suspended in mucilage and distilled water, and Lewin an aqueous solution of corrosive sublimate. The albuminate, cyanide, green iodide, formamide, peptonate, salicylate, succinimide, gray oil and other preparations of mercury, have also been experimented with and followed by good results. Liebreich claimed the formamide of mercury was the best preparation to employ hypodermically by reason of its being neutral in reaction, most soluble in water, and not coagulating albumin. The dose of this substance for hypodermic use is one-sixth of a grain (0.01 gm.); and Zeissl, of Vienna, found twenty injections the maximum number required to remove severe syphilitic manifestations. Kopp, however, after an experience of 3,000 injections, asserts that the formamide of mercury is valuable only in mild forms of primary and secondary disease. Martineau demonstrated thoroughly the utility of the peptonate of mercury in a large number of syphilitic patients. A compound known as glutine-peptone sublimate, containing twenty-five per cent. of bichloride, has been employed by Dr. Hüfler in Strümpell's clinic at Erlangen. The injections are said to be painless, unproductive of local irritation, and prompt in effect. The dose is two-thirds of a grain (0.04 gm.), equal to one-sixth of a grain (0.01 gm.) of mercuric chloride. This substance is made by first acting upon gelatine with dilute hydrochloric acid, from which results hydrochlorate of glutine peptonate, containing about twelve per cent. of hydrochloric acid. It is soluble in alcohol and forms a double salt with corrosive sublimate.

Dr. De Lucca, a clinical assistant in the University of Catania, has published the results of his experience with alaninate of mercury, or mercuric alanine. This substance is a combination of mercury with alanine or amido-propionic acid. The compound is soluble and easily absorbed. It was employed in the daily dose of one-thirteenth to one-sixth of a grain (0.0046 to 0.01 gm.). The average quantity of the drug used was three and a half grains (0.21 gm.) to each patient, the average duration of treatment 37.05 days. Suppuration occurred only in one-half per cent. of the total number of injections. No stomatitis was produced. The cures seemed to be permanent.[1] Wellander, of Stockholm, recommends the hypodermic injection of an acetate of thymol-mercury. It is said to cause less pain than calomel, to be less apt to create abscesses, and that more mercury can be introduced into the system than by the use of corrosive sublimate. The compound is insoluble in water and requires to be suspended. It has been used with success by Tadassohn and Zeissing, whose formula was as follows:

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[1] "Remarks on Treatment of Syphilis by Hypodermic Injections of Corrosive Chloride of Mercury." By the Author. The Lancet, London, September 6, 1884.

| | |
|---|---|
| ℞ Hydrargyri thymolo-acetici .............. | 1 part. |
| Paraffini liquidi .......................... | 10 parts. |

M. For hypodermic use.

The new preparation is likewise endorsed by Dr. Szadek, of Kieff, who administers it in a mixture of gum-arabic, of which the formula is:

| | |
|---|---|
| ℞ Hydrargyri thymolo-acetici ............. | 1.5 part. |
| Mucilag. acaciæ ......................... | 0.5 part. |
| Aquæ destillatæ ......................... | 20 parts. |

M. For hypodermic use.

Every three or four days, Szadek made an injection of this combination. He reports that in ordinary cases, six to ten injections are sufficient to suppress the manifestations. This mode of treatment is particularly valuable in the early stages of the disease.

The benzoate of mercury is preferred by Professor Stukovenkoff, of Kiev. This salt contains forty-three per cent. of metallic mercury, is a tasteless and odorless white crystalline substance, slightly soluble in cold water, but easily soluble in a weak solution of sodium choride. The favorable reports of its action have been endorsed by Balzer and Thiroloix.[2] Benzoate of mercury is not apt to cause pain, abscesses, or indurations, and may be employed in solution, four grains (0.24 gm.) to the ounce (32 gm.) of distilled water, together with one grain (0.06 gm.) of chloride of sodium and two grains (0.12 gm.) of hydrochloride of cocaine, in order to counteract the pain. It may likewise be used in the form of a ten-per-cent. emulsion with liquid petrolatum. One injection should be given daily, and it should be discontinued upon the appearance of stomatitis.

The salicylate of mercury is another salt which has of late been much used for hypodermic, or intramuscular, injection. It is a white, amorphous powder, devoid of odor or taste, scarcely soluble in alcohol or water. It is therefore prepared in the form of an emulsion, and is much less apt to excite local irritation than calomel. It exerts a prompt and decided effect upon the manifestations of syphilis. Szadek, who has employed this salt with satisfactory results, recommends the following formula:

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[1] Journal of the American Medical Association, April 21, 1888.

[2] Annales de Thérapeutique Médico-Chirurgicales, January, 1890, p. 11.

| | | |
|---|---|---|
| ℞ Hydrarg. salicylat. .... | gr. xvj. vel xxiv. | 1. or 1.4 |
| Mucilag. acaciæ ..... | gr. viij. | 0.5 |
| Aquæ destillat. ...... | f℥vss. | 22. |

M. For hypodermic use.

Fifteen minims of this mixture were directed to be injected into the gluteal region every fourth day. He thus treated a long series of cases, without observing a single local abscess due to the operation.

Besides the advantages of the absence of gastro-intestinal disturbances, less frequent administration, and less frequent symptoms of mercurialism, attending the use of all of the insoluble salts of mercury, W. S. Gottheil[1] of New York, claims that the best preparation for injection is a ten-per-cent. suspension of the salicylate of mercury in liquid petrolatum, as it rarely produces an abscess.

| ℞ | gm. or c.c. |
|---|---|
| Hydrargyri salicylatis .................... | 5 |
| Petrolati liquidi .......................... | 50 |

M. Sig.: For hypodermic injection.

½ c.c.=.05 gm. of the mercury; (10 m.=1 grain of the mercury; 5 m.=½ grain of the mercury.)

This must be thoroughly shaken before using.

The placing of a considerable quantity of an insoluble salt subcutaneously permits of its gradual conversion into a soluble compound with a consequent uniform absorption. Treatment so administered may be given at intervals of four, five, or more days. The kind of syringe is not essential, though the "all glass" variety with asbestos packing possesses some advantages. It should, however, be kept for this use and not used for anything else. It is not necessary to sterilize the injection fluid, after the first preparation provided ordinary care is observed in keeping it from contamination in small vials. The needles should be of almost 21 gauge, from 1¼ to 1½ inches long, and should be carefully sterilized after using. This is best done by letting them lie in ether or alcohol. The site of injection should be about half-way between the intergluteal fold and a line running parallel to it and dividing the buttocks into halves. The injection should be made on alternate sides, dividing each buttock into three injection sites, and governing the point of the next injection by palpating the tissues, *i.e.*, if a nodule is felt, place the injection in another spot. The horizontal position with the patient face downward is preferable for the injection, as in this position the muscles are relaxed. The skin is cleansed in the usual manner and the needle of the syringe filled for injection thrust in practically its entire length. If this is done rapidly there is almost no pain. The syringe should then be detached from the needle, which should be watched for an instant to see if any blood exuding from it indicates the puncturing of a vein. If not, replace the syringe and proceed with the injection. "Sealing" the injection puncture is regarded as an unnecessary refinement of technic. The first injection should be 5 minims of the above prescription, *i.e.*, ½ a grain (.03 gm.) of the mercury. Two days later this dose should be increased to 7 minims, representing ⅔ of a grain (.04 gm.) of mercury, and four days later the injection should be of 10 minims, representing 1 grain (.065 gm.) of mercury. From this time the average case requires about 1½ grains (.10 gm) of mercury, viz., 15 minims (1 c.c.) of the solution every seven days. Some cases, of course, require more mercury and some cases less, but the duration of the treatment should be two years.

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[1] New York Med. Jour., June 26, 1906.

After using most of the preparations just referred to, and the various combinations in which they are suspended, I prefer the simple solution of the corrosive chloride in distilled water, as being the most readily prepared, and just as effective as any that have been suggested.

The only valid objection to the hypodermic administration of the remedy is that pain is necessarily produced by the puncture of the needle. This pain is trifling in character, however, and speedily disappears. Another objection frequently urged is, that abscesses may be formed at the seat of the puncture. This complication will not occur, however, if care be taken to thrust the needle of the syringe deep into the subcutaneous or muscular tissue, so that the fluid can be speedily absorbed. In fleshy persons, I usually make use of the subcutaneous cellular tissue, inserting the injection deep into its meshes, preferring the integument of the back, or buttock, for the operation. In thin individuals, I always deposit the solution in the muscular tissue of any portion of the body; but more particularly the regions just alluded to. In 113 cases which I reported to the American Medical Association,[1] 2,132 injections were administered in 206 days without being followed by abscesses or any other inflammatory sequelæ. Since that time I have employed the same method 3,163 times in 441 cases, and in no instance have abscesses resulted. The formula which I use is:

| | | | |
|---|---|---|---|
| ℞ | Hydrarg. chlor. corrosiv. .............. | gr. iv. | 0.24 |
| | Aquæ .............................. | f℥j. | 32. |

M. Ft. solutio. For hypodermic use.

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[1] Transactions of the American Medical Association for the Year 1882.

In some cases, I begin by administering one hypodermic injection daily, of five minims of this solution, and increase the dose minim by minim every second or third day, until the disease begins to abate, or until the constitutional effects of the drug are manifested. I then lessen the dose sufficiently to keep the system gently under the influence of the remedy until all traces of the affection have disappeared. In others, particularly the more robust, it has been my practice for several years to give hypodermically as much as one-quarter to one-half a grain (0.015 to 0.03 gm.) of the corrosive chloride of mercury at intervals of every three or four days until a decided impression is made on the disease.

In a communication to the Medical Society of London, April 23, 1888, Mr. J. Astley Bloxam, F. R. C. S., stated that since 1884 he had used hypodermic injections of the same form of mercury 1,924 times. He recommends the solution for injection be made fresh for each *séance*, and that one-third of a grain (0.02 gm.) of the salt just named be inserted once a week deeply into the muscular tissue, especially of the buttock. Many of the patients in whom I employed the above method of treatment had previously been given mercury internally without much benefit; others presented such marked irritability of the gastro-intestinal tract that the administration of mercury *per os* could not be entertained. In such cases the hypodermic method enables the physician to promptly neutralize the poison of the disease, preserve the tone of the stomach, and support and invigorate the patient by a nutritious diet and the administration of tonics. The injection of insoluble forms of mercury, notably calomel, is not altogether devoid of danger. Kraus has reported a case in which one and a half grain (0.09 gm.) led to fatal dysentery and peritonitis. Professor Runeberg has seen two cases in which death resulted, in one from two and in the other from three injections, a week or more intervening between each operation. In each case there was diphtheritic infiltration of the large intestine, and in one perforation had occurred at the sigmoid flexure with consequent peritonitis; acute nephritis was also present. In the other case there was found at the spot of injection an abscess which contained unhealthy pus and a considerable quantity of mercury. Hebra, however, has not witnessed abscess or any ill result in a single case out of 16,000. Neumann, after 344 injections of calomel in fifty-two cases, concludes that the method is less effective than the treatment by inunction. It has been asserted by certain French writers, that much better results are obtained by using liquid petrolatum in preference to other fluids in preparing calomel or gray oil for injection. Dr. Watraszewski in favor of the yellow oxide of mercury in doses of from two thirds to one grain (0.04 to 0.06 gm.). He believes that mucilage is a better vehicle than an oil or glycerin, the oil exciting serious embolic pneumonia, while the mucilage merely produced small embolic foci which were absorbed without important subsequent reaction.

The following formula is recommended by Besnier:

| | | |
|---|---|---|
| ℞ Hydrarg. oxid. flav. | gr. xv. | 1. |
| Pulv. tragacanth | gr. v. | 0.3 |
| Aquæ destillat. | f℥j. | 32. M. |

Twenty-four minims, equal to three-quarters of a grain (0.045 gm.) of the salt, are injected every ten days until mercury appears in the urine. During the earlier months of the disease it is said that four grains (0.24 gm.) of the yellow oxide suffice to hold the manifestations in abeyance. With the development of new lesions, a fresh series of injections is instituted. Gray oil has also been used as an injection; but several fatal cases have been reported. Stomatitis and instances of fat embolisms in the lungs have occurred.

Hamel[1] advises local injections of mercury as medication in ulcerative and destructive syphilids and also when the lesions are localized at an inconvenient point. He advises it also when general treatment is impossible or has proved ineffectual or if there are kidney, intestinal or gum affections. Sixteen cases are described with the technique followed. The best results were obtained with an isotonic solution of mercury cyanid, 1 to 2,000, with a little anesthetic. A very fine needle is inserted, slanting, at one or more points, and enough fluid is injected to cause considerable infiltration. He made from five to ten injections, as a rule, with or without general treatment.

The danger of mercurial injections have been frequently recorded according to an editorial writer[2] of the "London Lancet." Professor Gaucher pointed out the special danger of injections of gray oil, as compared with injections of more soluble preparations. The mercury might accumulate and then suddenly undergo absorption with disastrous results. Thus in a case recorded by M. Letulle 21 injections were given almost weekly during a period of four months. Only after an interval of 20 days did the last injection provoke fatal stomatitis. In a recent case reported by Professor Gaucher to the Société de Dermatologie 15 injections were given without interruption; then symptoms similar to those of the case related above occurred and terminated fatally. The author's experience has been, on the other hand, entirely good and successful, and without any bad or fatal effects. Thousands of injections of the soluble salt, the corrosive chloride of mercury, in water, have been employed and always with the very best results.

THE INTRAVENOUS TREATMENT OF SYPHILIS.—Dr. G. Frank Lydston reports his experience and deductions in the intravenous treatment of syphilis.[1] His studies were made upon ten cases which are reported in the article. He concludes that it is a safe procedure, but does not claim that this method should be employed in all cases of syphilis, but considers it valuable when one wishes rapid medication, as in malignant syphilis. He says he is convinced that where the entire dosage is accurately placed within the lumen of the vein no reaction whatever will occur, and accidents should be infrequent, the tourniquet should be moved from the arm after the insertion of the needle into the vein and before the discharge of the mercurial solution has begun. By this method one gets speedy mecurialization of the blood, prompt systemic effect of the drug, relatively large doses can be given, freedom from painful effects of subcutaneous and intramuscular injections, and in general, the absence of gastro-intestinal disturbances.

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[1] "Treatment of Syphilids with Local Injections of Mercury." H. Hamel. Annales de Dermatologie et de Syphiligraphie, Paris. May 9, 1908, No. 5, pp. 257-349.

[2] "The Danger of Mercurial Injections," London Lancet, July 11, 1908.

F. J. Lambkin,[2] after a number of experiments, found that palmitin was the best vehicle for the mercurial salt or metallic mercury. He highly recommends the following combinations:

| | | |
|---|---|---|
| Hydrargyrum | | 10 grammes. |
| Equal parts of absolute creosote and camphoric acid | Creo-Camph... | 20 c.c. |
| Palmitin basis to | | 100 c.c. |

10 m. of above contains one grain of mercury.

| | | |
|---|---|---|
| Calomel | | 5 grammes. |
| Equal parts of absolute creosote and camphoric acid | Creo-Camph... | 20 c.c. |
| Palmitin basis to | | 100 c.c. |

10 m. contains one-half grain of calomel.

Melting point 37° Centigrade.

Lieutenant-Colonel W. B. Leishman, R.A.M.C., has examined both of the above creams and found "both sterile and that bacteria would not grow in either."

Eichhoff has lately experimented with europhen, given hypodermically, in both secondary and tertiary syphilis. The results seemed to be very satisfactory. His method was, to give each day an injection of three fourths to one and a half grain (0.045 to 0.09 gm.) of europhen dissolved in olive oil, beginning with the smaller dose.

ORGANIC SERUM FOR THE TREATMENT OF SYPHILIS.—Professor Hallopeau[3] gives the results obtained in syphilitic patients under his care by the use of an organic serum prepared by Dr. Quéry who, in a paper read before the Society on March 9, 1907, gave as his conclusion that the pathogenic agent of syphilis was a bacillus which reproduces itself by spores and of which the spirillum of Schaudinn is an involutionary form. Confirmatory evidence of the truth of this theory has since been obtained by Leuriaux and Geest, Bertarelli and Volpino, Benda, Krzyzstalowicz, and Siedlecki. The isolation of the bacillus in question has enabled Dr. Quéry to prepare an organic antisyphilitic serum which is prepared and used after the same method as the well-known antidiphtheritic serum. Professor Hallopeau mentioned that 20 cases had been treated with the serum and that a progressive improvement had been observed in every one of them. Professor Hallopeau further added: "The ameliorations observed should not be laid to the account of the normal evolution of the disease, for I have noted them as taking place from the very beginning of the secondary symptoms and they therefore indicate a definite action of the serum upon the evolution of the disease." No relapse has occurred upon certain cases treated by Dr. Quéry four years ago. Professor Hallopeau therefore concluded his paper by saying that the serum should be used in association with atoxyl or mercury and iodide of potassium.

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[1] Jour. Amer. Med. Assoc., Nov. 16, 1907.

[2] The Lancet, July 6, 1907.

[3] Proceedings of the Society of Biology of Paris, December 1907. London Lancet, January 25, 1908, p. 245.

Ionization or Electrical Cataphoresis.—Gaertner and Ehrmann, of Vienna, have devised a bath by which mercury may be introduced into the system through the action of electricity. The tub is made into two compartments, one above the other, separated by a diaphragm formed of an insulating substance and fitting almost hermetically to the human body. The body thus acts as the only communication between the two compartments, one of which is in contact with the positive and the other with the negative pole. The intensity of the current may be measured by means of a galvanometer. Either side of the body may be alternately subjected to the action of the positive electrode. Mercury appears in the urine within twenty-four hours, and may still be detected on the fourth day after the bath. Petersen and others have used this method for the tubercular syphilides with success, by covering the electrode with cotton moistened with mercurial solution.

General Medicinal Treatment of Late Syphilis.—As the boundary between the secondary and tertiary stages is not always well defined, the term *late syphilis* is frequently employed to include the obstinate secondary manifestations as well as the lesions of the tertiary and quaternary stages. The treatment in this period is varied and difficult. The remedies which are of especial service are the iodides of potassium and sodium. According to my experience, they are of equal value; but I do not prescribe the sodium salt in large doses to patients of the uric-acid diathesis, as it may result in the deposition of crystals of the insoluble urate of soda. The initial dose of the iodides should not exceed ten to fifteen grains (0.60 to 1 gm.) four times a day. In case the potassium, or sodium, salt prove depressant, the iodide of ammonium or of lithium may be substituted. G. Darzens believes that a combination of the iodides enhances their efficacy. In laryngeal and cerebral syphilis, Victor Augagneur advocates the association of potassium bromide and iodide.

If no appreciable effect be produced, or if symptoms of iodism do not appear, the dose should be rapidly increased, until one or two drachms (4 to 8 gm.) have been given three or four times a day for several weeks. Still larger doses, as high as an ounce and a half (48 gm.) daily, have been administered in cases of cerebral syphilis with safety and advantage. Wolff recommends that when given in such quantities the salt should be dissolved in decoction of rice in order to prevent iodism. The syrup of hydriodic acid is also a useful method of introducing iodine into the system. In anemic cases the syrup of ferrous iodide may be employed.

The iodides can be given in water, or in simple syrup, or in any of the bitter tonics. The good effect is enhanced by giving mercury in addition, either in the same prescription, or separately, at the same or different hours through the day. I usually administer them separately, directing the patient to take one-sixth of a grain (0.01 gm.) of the green iodide in pill-form, or one-sixteenth of a grain (0.004 gm.) of the corrosive bichloride in a bitter tonic before meals, and ten to fifteen grains (0.60 to 1 gm.) of the iodide of potassium in water an hour after meals. Where necessary, I give the corrosive chloride hypodermically, and the iodides by the mouth. Again, I have administered, in some cases, iodides,[1] preferably the potassium iodide, from three to five grains (0.18 to 0.30 gm.) injected deeply into the muscular tissue every two or three days, with most decided effect. Occasionally I have given one of the mercurials by the mouth and used the iodide[2] hypodermically, and at times the former has been injected and the latter given by the mouth. The iodide may also be administered by rectal injection when the stomach is disordered. The following formula has been recommended:

| | | | | |
|---|---|---|---|---|
| ℞ | Potass. iodid ................ | gr. xv. | 1. | |
| | Extr. belladonnæ ............ | gr. ¼. | 0.015 | |
| | Aquæ ...................... | f℥iv. | 128. | M. |

When it is desired to give both drugs in combination, by the alimentary canal, the following may be employed:

| | | | |
|---|---|---|---|
| ℞ | Hydrarg. chlor. cor. .......... | gr. ij. | 0.12 |
| | Potassii iodidi ............... | ʒv. | 20. |
| | Syr. zingiberi ................ | f℥iv. | 128. |

M. Sig.: Teaspoonful, in water after meals.

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[1] "Intra-muscular Injections of Preparations of Iodine in Syphilis." Schadeck, in St. Petersburg. Medicin Wochenschrift, No. 29, 1886.

[2] "Hypodermic Use of Iodide of Sodium." Arcari, in Wien. med. Woch., No. 4, 1886.

The well-known syrup Gibert is also justly esteemed by many practitioners. Its formula is:

| | | |
|---|---|---|
| ℞ Hydrarg. iodidi rubri | gr. v. | 0.30 |
| Potassii iodidi | gr. cclx. | 17.33 |
| Aquæ | fʒvj. | 24. |
| Syr. simp. *vel* vanillæ | Oj. | 500. |

M. Sig.: One teaspoonful three times a day.

Van Buren and Keyes recommend the following:

| | | |
|---|---|---|
| ℞ Hydrarg. iodidi rubri | gr. jss. | 0.09 |
| Ammonii iodidi | ʒj. | 4. |
| Potassii iodidi | ʒij. | 8. |
| Syr. aurantii cort. | f℥j. | 32. |
| Tinct. aurantii cort. | fʒj. | 8. |
| Aquæ q. s. ad | f℥iij. | 96. |

M. Sig.: Teaspoonful, in water after meals.

Hutchinson, in the lesions of late syphilis, recommended a combination of the iodides of potassium, sodium, and ammonium, together with a small quantity of free ammonia. Iron, quinine, arsenic, strychnine, and the mineral acids given at times are useful. Marked benefit will be derived from the occasional administration of stillingia, guaiacum, sarsaparilla, sanguinaria, and other vegetable alteratives and sudorifics, as alder-bark, corydalis, mezereon, phytolacca, helianthemum, lappa, sambucus, and manaca. The most important of these have been combined with the iodide of potassium to form a serviceable mixture known as the compound syrup of red clover. Also in the compound fluid extract of stillingia of the National Formulary, which, if preferred, may be given combined with syrup or aromatic elixir (1 part to 3 of the vehicle), to which potassium iodide or syrup of hydriodic acid can be added, if desired. In his experiments with iodol, Szadek ascertained that this drug is more beneficial in late than early syphilis. It may be substituted for iodide of potassium in doses of one quarter to five grains (0.015 to 0.30 gm.) three or four times a day. Dr. Haines has witnessed excellent results from the exhibition of cascara amarga in late syphilis. In secondary and tertiary syphilis I have administered with very good results the iodo-sulphate of cinchonine in doses of one to five grains (0.06 to 0.30 gm.) three or four times a day. Baths, fresh air, and a nutritious diet are of paramount importance. Anodynes must be given when necessary, to relieve pain or procure sleep. Dr. J. D. Menzies has, in several cases of precocious malignant syphilis, observed speedy improvement under the use of thyroidin tablets. The serum of the lamb, ox, or dog has been used subcutaneously in constitutional syphilis and is claimed to be of benefit. The quantity of serum injected at a time was one and a half fluid drachms (6 gm.). These methods may be mentioned and may deserve trial, but our present knowledge of them is defective and inconclusive, and no time should be lost in putting the patient upon the mercurial or mixed treatment.

Local Treatment.—The local treatment of the initial lesion has been described; but it may be mentioned again that Metchnikoff and Roux claim to have demonstrated the protective action of calomel against infection. When an ointment (20 gr. to ℥j) of calomel is rubbed in an abrasion within a few hours after inoculation, it has been found that constitutional infection did not occur. Macular eruptions are usually uninfluenced by ointments or lotions, but are materially modified by fumigation treatment, or by ordinary vapor-baths. Papular manifestations may be improved by baths and fumigation. The following lotion is serviceable, especially in the facial papular eruptions:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. cor. | gr. ij. | 0.12 |
| Spt. vini rect. | f℥ss. | 16. |
| Aquæ rosæ | f℥iijss. | 112. |

M. Sig.: Use externally every three or four hours.

Ointments are also of value:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. mitis | gr. xx. | 1.30 |
| Bismuth subnit. | ʒij. | 8. |
| Ung. aquæ rosæ | ℥j. | 32. |

M. Ft. ung. Sig.: Apply externally night and morning.

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. cor. | gr. j. | 0.06 |
| Phenolis liq. | gr. v. | 0.30 |
| Plumbi carb. | ʒiij. | 12. |
| Adipis | ℥j. | 32. |

M. Ft. unguent. Sig.: Use externally twice a day.

Ointments containing the nitrate and oleate of mercury, diluted in the proportion of one part to five or six parts of the base or more, may also be used with benefit. Moist papules should be cleansed with soap and water, or salt and water, and then dusted over with a powder of equal parts of bismuth subnitrate and powdered cinchona; or one part of the mild chloride of mercury and seven parts of bismuth subnitrate. Caustic lead is recommended by Bockhardt[1] as an application to condylomata. He made use of Gerhardt's formula, 3.3-per-cent. solution of oxide of lead in a thirty-three-per-cent. solution of caustic potash. One of the most efficient methods of treating condylomata is by the galvano-cautery. The ointment of arsenic oleate is an effective application to these lesions. It is also good practice to touch their surface with a solution of chromic acid, ten grains (0.60 gm.) to the drachm (4 gm.) of water. Thymol iodide is an excellent application to ulcerated lesions. It may be added that this drug has been found efficacious in the local treatment of syphilitic ozena, administered either by insufflation or in the form of ointment.

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[1] Monatshefte für prakt. Dermatol., vi, 1888.

Mucous patches or ulcers within the mouth may be touched with silver nitrate, copper sulphate, or mercuric nitrate in solutions of varying strength. A solution from ten to fifty per cent. of chromic acid has also a good effect. A mouth wash containing hydrogen dioxide should be used before making the applications.

In alopecia, local applications are serviceable in addition to the constitutional treatment. Besnier[1] recommends that the following liniment should be well rubbed into the scalp every night with a soft brush:

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|---|---|---|---|
| ℞ Tinct. cantharid. | fʒijss. | 10. | |
| Spir. rosmarin | fʒxxv. | 100. | M. |

In the morning, the scalp having been washed with soap and hot water, the following ointment is applied:

| | | | |
|---|---|---|---|
| ℞ Acid. salicylici | ʒss. | 2. | |
| Sulphur-precip. | ʒiij. | 12. | |
| Adipis lanæ, | | | |
| Petrolati | āā ʒxijss.[2] | 50. | M. |

The papulo-squamous and tubercular lesions are obstinate, and require the protracted use of stimulating mercurial applications. Fumigation and vapor-baths in addition will be found beneficial. The pustular, rupial, bullous, and ulcerative lesions run a tedious course, and are more amenable to internal than external treatment. Their healing may be hastened, however, by detaching the crusts, removing all discharges from the underlying surface, and then cauterizing it with a strong solution of nitrate of silver, corrosive chloride of mercury, liquefied phenol or very dilute acid nitrate of mercury solution. Other excellent applications in this class of lesions are iodol and iodoform, but the peculiar and diffusive odor of the latter will limit its employment to hospital practice.

Gummata should not be opened unless the fluctuations becomes pronounced. When this takes place, an incision may be made at the most dependent part of the swelling, its contents evacuated, and the cavity syringed out with a strong solution of tincture of iodine or corrosive chloride, and then permitted to heal by granulation.

**Prognosis.**—The prognosis is not unfavorable, as a rule. The improvement in personal habits and hygiene, and adoption of a methodical rational treatment, have divested the disease of many of its terrors. It would be folly to deny, however, that it is a serious affection, and that it does not tax the skill of the physician to the utmost extent. Much depends upon the age of the patient and state of his constitution, but more upon the prompt and systematic administration of appropriate remedies. In young robust adults, properly treated, the disease seldom passes beyond the secondary stage. Old people, young children, and the debilitated of all ages, are unfavorable subjects, but frequently recover promptly. According to Prof. Fournier, syphilis accidentally acquired by physicians from patients is of exceptional gravity, a result which he attributes to moral and physical depression. Intemperate or dissolute persons suffer more than those who lead an even life. When the syphilitic poison is added to the gouty, the rheumatic, or the scrofulous diathesis, it is apt to pursue an obstinate course.

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[1] La France Médicale, Sept. 5, 1889.

The prognosis is also influenced by the character of the cutaneous manifestations. Macular or papular eruptions usually indicate a mild case. Pustular eruptions are symptomatic either of a more severe infection, or a debilitated condition of the patient. Rupia is significant of a malignant form of the disease. Tertiary syphilis is always serious, but varies in severity in accordance with the organs involved. Syphilis of the nervous system is invariably grave, and frequently fatal. Syphilis of the internal organs is also to be dreaded. The disease is always amenable to treatment, however, and even in the most hopeless stages can frequently be cured, or considerably ameliorated. "How long after syphilis has been apparently cured should a patient remain single before he can marry, without endangering his wife and expectant offspring?" is a question often asked. The general consensus of opinion is that if a patient has been under observation for three years, and no manifestations of the disease have appeared during the last year, he may marry without fear of communicating the disease to his wife or entailing it upon his children. A. Cisatte,[1] in an article, embodied the opinion of fifty-three leading clinicians in Europe and America as to when to allow syphilitics to marry. The shortest interval is given by the American and English authors—two years between the initial accident and marriage. Fournier requires four years of intermittent courses, with two years free from offensive recurrence of the syphilis. Herxheimer demands the longest interval—ten years. Great stress is laid by the German authorities consulted on the disappearance of glandular lesions as proof of the efficacy of the mercurial treatment, with local treatment of glandular lesions. The author believes the safest and best course to follow is to subject all syphilitic patients who wish to marry to a serum diagnosis and likewise have a careful microscopical examination made of the blood. If the serum diagnosis is negative and the blood is normal, marriage can then be recommended. A. Ravogli[2] asserts that when a patient has suffered from syphilis he should not be permitted to marry until he has undergone a regular treatment for a period of four years, with the stipulation that for over a year no specific symptoms should have reappeared. He adds: "With a well-regulated office of this kind for the sanitary inspection of the aspirants to marriage there would be obtained a prevention of the spreading of syphilis and its introduction into the families with the sad and fatal consequences which we have already considered." In imperfectly cured cases, even though the disease exhibit no notable manifestations, it remains transmissible for a long and perhaps indefinite period. Barthelémy has reported a case in which a child inherited syphilis from parents, both of whom had had the disease fourteen years previously, and though irregularly treated, had been free from symptoms for many years. Prof. Fournier has seen it inherited after a lapse of twenty years. As a rule, hereditary syphilis is acquired during the three years following the first manifestation of the disease in the parent. After this time, even in the absence of treatment, susceptibility to inheritance is greatly and progressively diminished.

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[1] Ann. de Derm., December, 1907.

[2] "Syphilis in its Medical, Medico-legal, and Sociological Aspects." By A. Ravogli, M.D., New York. The Grafton Press, 1907.

As a rule, one attack of syphilis confers subsequent immunity. The victims of hereditary disease are protected against acquired infection. To this rule, however, exceptions doubtless occur. It is usual to consider that a second infection is evidence that the first attack was completely cured; and, in fact, this is one of the arguments relied upon to prove that the affection is curable. J. Brew,[1] of Nashville, Tenn., describes a case seen by himself and treated at various times by two reputable physicians, in which there was every reason to believe that syphilis had existed and had been cured and that a reinfection had occurred. The patient was treated carefully for an undoubted attack of syphilis, from which he recovered and remained without any syphilitic manifestations for fifteen years. He was then treated for a hard chancre followed by a macular eruption and sore throat. Marrying then, a syphilitic child was born to the couple, although the mother showed no evidence of ever having had the disease. The manifestations of the second attack could not have been tertiary in their nature. An interesting exceptional case has been observed by Dr. Augusto Ducroy.[2] The patient, a woman, forty-six years of age, whose body was much scarred as a result of ulcerated syphilides, and who likewise exhibited a gumma of the scalp, was reinfected. The new infection manifested itself by an induration of the right labium majus, general glandular enlargement, syphilitic roseola on the trunk and limbs, mucous patches on the soft palate and velum, syphilitic fever, and osteoscopes. Subsequently iritis and a pustular syphiloderm developed. Coincidently the gumma upon the scalp became deeply ulcerated.

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[1] Medical Record, New York, July 27, 1907.

[2] Giornale Italiano delle Malatti Veneree e della Pelle, December, 1888.

THE MORTALITY FROM SYPHILIS.—Fernet[1] states, in an article, that in the general hospital where his data were collected 2.25 per cent. of the deaths were due to syphilis; in the insane asylums Joffroy reports 40 per cent. in 63 deaths, and Séglas, 46.61 per cent. of 182 deaths for which syphilis was alone responsible. Inherited syphilis was responsible for about one-twentieth of the total number of abortions known, for about one-fifth of the deaths among infants less than two weeks old, and for considerably more than a tenth of the deaths among children under 2 years old. This makes for Paris alone a mortality of about 4,000 deaths annually from inherited syphilis, or from 75 to 80 deaths a week.

CONGENITAL SYPHILIS.—Infantile syphilis is either acquired or congenital. If acquired, it is the result of inoculation with the secretions of a syphilitic lesion during parturition, or after delivery. Numerous cases are recorded in which the disease has been communicated by a mucous patch or tubercle on the nipple of a wet-nurse. The large majority of cases are congenital in character, however, and are the result of infection *in utero.*

There are many unsettled problems in regard to the transmission of syphilis to the embryo, but the weight of authority is in favor of the opinion that infection can only occur through the medium of the maternal circulation. If the mother is suffering from syphilis when impregnation occurs, or if she become infected then or at any time previous to the seventh month of pregnancy, the disease will certainly be communicated through the utero-placental circulation.

Dr. W. C. Pauli,[2] in a study of placental syphilis, reports as follows upon this important question: The conclusions to be drawn from this study of the subject are (1), that the *Spirocheta pallida* is rarely found in syphilitic placentæ, and then only after long and tedious search. (2) That the anatomical changes observed in the placenta, are the result of toxins produced by the *Spirocheta pallida* in the fetal organs, and not to the immediate effect of the organisms upon the villi themselves. (3) The placenta is not the nidus of infection. The fact that the *Spirocheta pallida* is never found in the maternal portion of the placenta, but only in the blood-vessels and stroma of the fetal villi, would suggest that the placenta offers greater resistance to the invasion of the organisms, which is probably due to the steady flow of antibodies or immune substances from the mother through the maternal circulation.

One of the most frequent results of maternal syphilis is a succession of abortions or miscarriages. In post-mortem examinations of the bodies of twenty-eight still-born syphilitic infants, M. Barthelémy[1] failed in most cases to discover any lesion. Gummata were found in five cases, while in eight others the liver was granular, and, upon microscopic examination, miliary gummata of the liver and kidneys were observed. The spleen was in most cases somewhat larger than normal, but in other respects unaltered. The liver, kidney and other organs, when examined and stained show the spironema pallidum, in greater or less numbers.

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[1] "Mortality from Syphilis." C. Fernet. Bulletin de l'Académie de Médecine, Paris. December 24, 1907, lxxi, No. 44, pp. 571-601.

[2] "Placental Syphilis; A Study of Syphilitic Placentæ with Regard to the Presence of the Spirochæta Pallida." By W. O. Pauli, M.D.; Johns Hopkins Hospital Bulletin. November, 1908.

As a rule, the earlier the ovum is infected, the sooner will it be expelled. The pregnancy may, however, go on to full term, and terminate in the birth of a still-born child or of a live child, bearing the stigmata of inherited syphilis. One of the most characteristic symptoms of syphilis, in mothers, is a recurrence of apparently causeless still-births. In some cases the child is born alive, but puny, shrunken and covered with an eruption, which needs no explanation. In other instances, however, when the child is born alive, it presents an apparently healthy appearance, but evidences of parental vice or misfortune become manifest in a short time. In one hundred and fifty-eight cases of hereditary syphilis, which were recorded by Diday, the first symptoms appeared, in eighty-six, during the first months after birth; in forty-five, during the second month; in fifteen, during the third month; and in the remainder, during the fourth and fifth months. These statistics show that the disease appears almost uniformly in from two to twelve weeks after birth. If no symptoms occur during the first six months of infantile life, the probability is that intrauterine infection did not take place. The disease, however, may be latent, and appear unexpectedly at a much later period.

Carpenter[2] calls attention in a contribution to an internal snuffles, the discharge being localized to the posterior nares and the nasopharynx and its finding its way into the stomach. Craniotabes is the most common in the second and third months—the syphilitic age—and rickets after nine months—the rickety age. It is found in syphilitic fetuses and occurs in syphilitic infants. Carpenter has found it as an isolated lesion in cases in which he has known one or other parent to be syphilitic; also in cases in which he has attended for syphilis a brother or sister immediately preceding the patient; in association with marked anemia responding rapidly to mercurial treatment, and with snuffles. He always suspects syphilis whenever he finds craniotabes. It is a good working hypothesis. It has not been unusual in his experience to find multiple epiphysitis as the sole manifestation of hereditary syphilis. A suspicious attitude of mind is indicated whenever enlargement of the spleen is found during the syphilitic age. Not only are splenic enlargements common during this period, but enlargements of the liver follow them fairly closely.

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[1] British Journal of Dermatology, October, 1890.

[2] "Congenital Syphilis in Infants." G. Carpenter. British Journal of Children's Diseases, London, February, 1908.

Infants in whom the symptoms of syphilis are evident at birth are usually puny and undeveloped, and present a withered or prematurely aged appearance. The skin is dry, loose, and wrinkled, and of a tawny or dull-yellow hue. In some cases, large areas of pigmentation are observed. The hair is dry and scanty, and the nails are brittle, distorted, or stunted. The neck is thin and wrinkled, and the submaxillary glands are enlarged. Various forms of eruptions are present upon the skin, especially tubercles and bullæ. Patches of erythema are scattered over the different portions of the body, beginning upon the lower part of the abdomen, as a rule, and spreading thence to the limbs, chest, and face. The tubercles are large and flat, and widely disseminated. When situated on the buttocks and around the genital regions, and in the flexures of the joints, they become converted into mucous patches, but in other regions of the body frequently break down and ulcerate. The bullæ are similar in appearance to those of pemphigus. They are round or oval in shape, and vary in size from a small bean to a walnut. When first developed they contain a clear, serous fluid, which finally becomes opaque or greenish-yellow in color and purulent in character. They are seated upon a reddened, infiltrated base, surrounded by a dark-red or coppery areola, and are generally confined to the palms and soles, but are liable to appear upon any portion of the body, and in malignant cases not infrequently cover the entire surface. They burst spontaneously in a few days, forming yellowish or greenish crusts, which cover superficial or deep ulcers. Sometimes the ulcerations gradually heal, and the child slowly improves in health and strength, and finally makes a good but a tedious recovery. On the contrary, however, especially when the eruption is disseminated or the ulceration severe, the child suffers greatly, cries continually, and either refuses to take any nourishment or only a small quantity at long intervals. It gradually becomes weaker and weaker, and dies in a few days, either from inanition or from an intercurrent diarrhea. Occasionally it recovers from the first eruption, but a new crop of bullæ appears after a short interval, and, from the irritation and exhaustion which it induces, death speedily follows.

Infants who have been infected with syphilis during intrauterine life, but who do not exhibit any symptoms of the disease when born, may remain apparently well for several weeks or months, and even show a progressive gain in weight and color. As a rule, however, they present a peculiar melancholy appearance, and although nursing with avidity they do not get plump. They are feverish and restless, and suffer from more or less diarrhea. The countenance is pallid or of a sallow hue, and the eyes have a peculiar staring aspect. Finally, they begin perceptibly to fail in health and strength, becoming weak and emaciated, and crying nearly all the time. The subcutaneous fat diminishes or disappears, and the skin is dry, harsh, wrinkled, and sallow. These changes are especially noticeable about the face, which assumes a withered-up or wizened appearance, like that of a little old man or woman. Erythematous spots and patches are developed upon various portions of the body. They are irregular in shape and in size. They are usually light-red in color, but may be of a yellow or coppery hue. They are first observed upon the buttocks, or on the genital regions, but may be diffused over the entire surface. Many of the spots or patches become elevated in a few days, and are transformed into papules and mucous patches. Mucous patches, or moist papules, are the characteristic manifestations of hereditary syphilis. They are developed, first, at the junction of the skin and mucous membrane around the mouth, nose, anus, and other natural orifices of the body; then in the axillæ, between the toes and fingers, behind the ears, around the umbilicus, between the buttocks, and wherever heat, moisture, and friction coexist, as in the flexures of the joints; also on the tongue, roof of the mouth, and back of the pharynx and in the larynx.

Syphilis of the larynx is much less common in hereditary than in acquired syphilis, but laryngitis and mucous patches, followed by stricture or perichondritis, have been seen by several authors, especially Mackenzie, of Baltimore. The voice is hoarse or entirely lost. Several cases of this kind have been reported by Sevestre. In some cases superficial desquamation of the epidermis occurs at the site of the eruption; in others, the papules and erythematous patches become fissured or excoriated, and finally become the seat of extensive ulceration. Pustular eruptions are seen less frequently; they are usually commingled with vesicles and papules, and run a rapid course, terminating in ulceration and the formation of brownish or greenish crusts.

A succession of bullæ may occur from time to time, until the infant perishes from exhaustion. This form of syphilide is usually complicated by tubercles, pustules, and other lesions. In some cases, however, the bullæ are the only symptoms present. Another marked symptom of hereditary syphilis, frequently observed before the cutaneous lesions become manifest, is "the snuffles." This is a peculiar noise heard during inspiration, and is due to the obstruction in breathing caused by the seropurulent discharges of an accompanying syphilitic coryza, or syphilitic inflammation of the nasal mucous membrane. The discharge is thin and watery at first, but soon becomes thick and tenacious, and accumulates in the nares to such an extent that breathing is interfered with, and the peculiar snuffling sound produced. As the disease progresses the obstruction increases, and finally becomes so complete that no air passes through the nostrils. The child is then compelled to breathe through its mouth altogether, and, as it can not do this and suck at the same time, nursing is rendered difficult or impossible. Necessarily, the child suffers from want of nutriment, and also from pain. If the morbid process still continue, the nasal discharges assume a fetid character; the mucous membrane becomes the seat of ulceration, which may involve the cartilage, and even extend to and destroy the small bones of the nose or of the palate. The mucous membrane lining the pharynx and larynx is usually more or less infiltrated and swollen, producing the characteristic syphilitic roughness or hoarseness of voice. In some cases the swelling is so excessive as to produce complete aphonia. Conjunctivitis, keratitis, and otitis may also follow.

In severe cases, the child becomes more and more emaciated; death ensues in a few days or weeks from inanition or from an exhausting diarrhea, or from an intercurrent attack of pneumonia or capillary bronchitis. In rare cases, death has taken place in a few hours from edema of the glottis. In less severe cases, the coryza and the cutaneous lesions gradually disappear, the child slowly gains in weight and strength, and recovers with more or less nasal or palatine deformity. Corneal opacity, or purulent otitis, with impairment of sight or hearing, may also result. Optic neuritis is not uncommon. In mild cases, an apparent recovery sometimes takes place without any deformities or sequelæ whatever. The poison, or its impression, frequently remains in the system, however, and becomes manifest at a later period in the production of various lesions of the periosteum, the bones, the teeth, the skin, the viscera, and the nervous system. The consideration of these lesions properly belongs to a systematic treatise on general syphilis.

Furthermore, so profoundly is nutrition modified by congenital syphilis that many morbid conditions besides the lesions symptomatic of the disease are attributed by Fournier to this inheritance. Such are the arrests of development not infrequently witnessed—delayed dentition, slow general growth, retarded puberty, etc. He believes that this taint is often the remote origin of congenital deformities, as club-foot, spina bifida, hare-lip, cleft palate, etc. It certainly predisposes to the acquisition of scrofulo-tuberculosis. It reduces the vitality of the cells of the derma so that various forms of skin diseases may develop, which are not amenable to antisyphilitic remedies. Tarnowsky regards it as a predisposing cause of rachitis. Manifestations due to inherited syphilis may recur for many years. A case is related of a boy, fifteen years of age, admitted to St. Thomas's on account of a tumor of the liver, accompanied by a peculiar temperature record, ranging from subnormal in the morning to 100° or 103° F. in the evening. Examination of the eyes gave evidence of past syphilitic keratitis, and a history was obtained of an infection of the eyes when the boy was seven years of age. Antisyphilitic treatment reduced the febrile temperature to normal within a few days, and the swelling of the liver gradually disappeared. An unusually severe case of congenital syphilis in a girl of thirteen has been described. In addition to extensive and obstinate ulcers, necrosis of bone, and deformed extremities, fracture of the humerus and femur resulted from such slight force that the accident might almost be considered spontaneous. Dr. Bulkeley has seen ulcerated gumma of the arm in a woman of twenty-three years who had inherited syphilis. Instances are sometimes observed which raise the question whether the disease may not be transmitted to the third generation, but it is difficult to establish all the links in the chain of evidence and the facts may have been misinterpreted. Hereditary syphilis in some instances occasions deafness, and without premonitory symptoms. Giddiness and pains in the ears are sometimes present. Ocular symptoms, due to interstitial keratitis, iritis, or choroiditis, usually precede the deafness. This loss of hearing is more frequent in females and between the ages of eleven and thirteen. It is unamenable to treatment, and its pathology is uncertain.

**Diagnosis.**—The diagnosis of infantile syphilis is generally self-evident. The senile facies, snuffling inspiration, and cutaneous lesions, form a trio of symptoms never present in any other disease. Simple coryza may produce difficulty of breathing, and will interfere with nursing, but disappears in a few days, and is not accompanied by cutaneous manifestations, or the syphilitic countenance. The papular rash, termed "red gum," which occasionally appears after birth, might be mistaken for syphilis, but is a trivial affection, and disappears spontaneously. Intertrigo and papular eczema sometimes present a superficial resemblance to syphilides, but their course, history, and concomitant symptoms are widely different. Syphilitic bullæ may resemble those of pemphigus, but are situated on a reddened, indurated base, surrounded by a dark-red or coppery areola, followed by superficial ulceration and the formation of thick, brown, or dark-green crusts. Coryza, the senile countenance, and other indications of syphilis, are also present.

Jonathan Hutchinson has pointed out that after the second dentition the teeth, especially the central upper incisors, testify to the presence of hereditary taint. These teeth are usually short and narrow, presenting a broad vertical notch at the edges and being rounded off at the corners. This appearance, if present, is regarded as pathognomonic. It is, however, often absent.

**Treatment.**—The treatment of congenital syphilis is prophylactic and remedial, and should be commenced at the earliest possible moment. If a pregnant woman has a suspicious eruption, or a history of a succession of miscarriages or still-births, or any other appearances of infection, she should be placed at once upon a mild mercurial course. Chalybeate and other tonics may also be given. The plan of treatment which I frequently adopt consists in the administration of a teaspoonful of the following combination one hour before meals:

| | | | | |
|---|---|---|---|---|
| ℞ | Hydrarg. chlor. corros. ............ | gr. j. | 0.06 | |
| | Tinct. nucis vomicæ .............. | fʒj. | 4. | |
| | Tinct. gentianæ comp. ............. | f℥iij. | 96. | M. |

and ten drops of tinct. ferri chlor., or ten grains (0.60 gm.) of potassium chlorate in water, half an hour after meals. The patient is placed upon a generous diet, and directed to stay in the open air three or four hours every day. If the mercury derange the stomach, it may be omitted from the above prescription, and given by inunction. This, however, will seldom be necessary.

Besnier reports favorable results from the administration of the syrup of the iodide of iron with wine of cinchona, a pill containing one-sixth of a grain (0.01 gm.) of bichloride of mercury, one-twelfth of a grain, (0.005 gm.) of extract of opium, and one-twelfth of a grain (0.005 gm.) of extract of gentian being also given thrice daily. The iodide of potassium in amounts from seven and a half to fifteen grains (0.5 to 1 gm.) daily is furthermore advised.

When the child is born, it should be nourished by its mother's milk, if possible. If the supply is inadequate, or if the parent's condition is such that nursing is not advisable, the infant must not be given to a healthy wet-nurse to suckle, but fed on cow's milk, or some of the many substitutes for its natural food. This is a rule to be rigidly enforced, or the gravest consequences may follow. Whole families have been infected by nurses who unwittingly contracted the disease from the lips of syphilitic infants while in their charge.

The suggestion has been offered by Dr. Fredet that, in order to avoid such calamities, syphilitic infants should, whenever possible, be suckled by goats or other animals not subject to the disease. This method has, in fact, been previously attempted and is no doubt beneficial, but has been found very difficult to faithfully carry out in practice.

If the milk disagrees with the child's stomach, or fails to be properly digested, from one to three grains (0.06 to 0.18 gm.) of pepsin may be given with each feeding. The child should be warmly clothed, well supplied with fresh air, and bathed every day in water in which a little common salt has been added. Inunctions of codliver oil are beneficial. The medicinal treatment consists in bringing the system under the influence of mercury as rapidly as possible. This can usually be done by giving one-sixtieth of a grain (.001 gm.) of the corrosive chloride of mercury and ten drops of Huxham's tincture in water, four times a day. Good results can also be obtained from the administration of one-twelfth of a grain (0.005 gm.) of mild chloride of mercury or one-quarter of a grain (0.015 gm.) of mercury with chalk three times a day. Again, the yellow iodide may be beneficially employed and is especially valuable when combined with half a grain (0.03 gm.) of the saccharated carbonate of iron. For a child six or seven months of age a combination of biniodide of mercury with iodide of sodium is useful, according to Eloy. The good effects of mercury will usually be enhanced, and its disadvantages minimized, by giving from one to three minims of tincture of chloride of iron three times a day. When the stomach will not tolerate mercury in any form, its internal administration must be suspended, and half a drachm (2 gm.) of mercurial ointment, diluted with three drachms (12 gm.) of lard, thoroughly rubbed into the skin every day. This may also be rubbed on the bandage, which is placed around the child's body, instead of upon the skin directly. Purified wool-fat forms an excellent excipient for mercurial ointment. Wiederhofer, of Vienna, prefers the red precipitate, one part to one hundred parts of adeps lanæ, to the mercurial ointment. After inunction has been practised for a few days, it is advisable to administer a warm bath. Eloy writes favorably of the effects of corrosive sublimate baths. Three grains (0.18 gm.) of corrosive sublimate and fifteen grains (1 gm.) of chloride of ammonium are dissolved in a half-pint (256 gm.) of distilled water and then added to the quantity of warm water which has been drawn for the bath. Moncorvo and Ferreira have recently applied the hypodermic method of treatment to infants and children. They obtained the most favorable results from the use of gray oil and corrosive sublimate. The injections, made under strict antiseptic precautions, occasioned little pain and were not followed by subsequent reaction. The ages of the children varied from three months to fourteen years. The doses of corrosive sublimate employed were one or two milligrammes ($\frac{1}{64}$ to $\frac{1}{32}$ grain), and were repeated every third, fourth, or fifth day, according to indications.

The local treatment should be of a mild, protective nature. The nostrils can be kept clean with a camel's-hair brush dipped in rose water and glycerin. Mucous patches are to be dusted with calomel, painful fissures touched with a strong solution of nitrate of silver, and all ulcerated or excoriated surfaces covered with a powder consisting of one part of mild chloride of mercury and five parts of bismuth subnitrate.

Obstinate cases, or cases in which the symptoms do not become manifest at an early period, generally exhibit marked improvement when half a grain or a grain (0.03 to 0.06 gm.) of potassium iodide is added to each dose of the mercurial. In all cases the treatment should be continued for several months, then suspended for a week or two, to be again resumed for a prolonged period. Chalybeate and other tonics are advisable at intervals. The syrup of the iodide of iron, in from half a minim to three minims, will be especially serviceable. Quinine, strychnine, potassium chlorate, and the mineral acids are also invaluable as adjuvants to the specific treatment.

**Prognosis.**—The prognosis of hereditary syphilis varies in accordance with the extent and severity of the lesions, the time of their manifestation, and the general condition of the child. As a rule, the more extensive the eruption, and the earlier the time of its appearance, the more unfavorable will be the prognosis. Children who are covered with papules or bullæ at birth usually die within a few days. Severe coryza is also a bad symptom, but not necessarily indicative of a fatal result. When the eruption is pustular or tubercular in character the prognosis is more unfavorable than when it consists solely of macules or papules. Children who are born apparently healthy, and who remain free from any affection of the skin or mucous membranes for several weeks, seldom develop the malignant form of the disease.

## DERMATITIS.

Dermatitis is a simple inflammation of the skin occasioned by violence, the external application of irritating materials, extremes of heat and cold, reflex disturbance from various diseases, or is produced by the ingestion of certain medicinal substances. In other cases it is probable, as pointed out by Mr. David Walsh,[1] that dermatitis results from direct irritation of the epithelial cells constituting the excretory apparatus of the skin. Such irritation may be due to drugs, to chemical bodies generated by tissue metabolism, or by bacterial activity. An increased production of normal substances representing waste, such as urea, may have the same effect. The irritation caused by the excretion of drugs is strictly analogous to that excited by the poisons of disease.

Dermatitis will vary according to the nature and intensity of its cause, the susceptibility of the skin, the state of the individual's health, and many other circumstances. It may begin as a mild or severe erythema, and continue as such or may change to a papular, vesicular, pustular, bullous, or gangrenous condition. Dermatitis may be limited to a small area or diffused over almost the entire surface. The attendant symptoms of inflammation, redness, swelling, heat and itching, or pain, exist in varying degree. There are six varieties of the disease—dermatitis traumatica, dermatitis venenata, dermatitis calorica, dermatitis medicamentosa, dermatitis epidemica and dermatitis gangrenosa.

DERMATITIS TRAUMATICA.—This variety includes all active and passive inflammatory conditions of the integument due to violence. It embraces punctures, incisions, excisions, contusions, lacerations, and all injuries which may happen to the skin. Among the many causes which may give rise to traumatic dermatitis are pressure and friction from clothing, shoes, bands, etc.; excoriations from scratching in the course of many cutaneous diseases, especially the animal parasitic affections, pediculosis, and scabies, and the bites and stings of the lower animals. Finally, certain superficial cutaneous affections, particularly erythema, may terminate in simple inflammation.

The irritation incident to certain occupations may occasion dermatitis, as in the affection described by Leloir under the title of follicular and circumfollicular dermatitis of spinners and *tacheurs*. The eruption is a disseminated inflammation of the hair-follicles, which form small dark red papules and sometimes becomes ecthymatous or furuncular. There is much itching. Half the workmen are attacked by the affection, which is caused by the Russion petroleum-naphtha and other mineral oils employed. Cleanliness is protective, and the disease soon disappears when the subject is removed for a few days from the source of irritation. A similar inflammation may follow application of tar to the skin.

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[1] Medical Press and Circular, October, 1890.

DERMATITIS VENENATA.—This form of dermatitis comprises all inflammations which are the result of the contact of various poisonous and irritating substances with the integument. The inflammation may be of a mild or severe type, according to the susceptibility of the individual and the character of the substance coming in contact with the skin. Various chemical and medicinal substances—such as acids, alkalies, and other caustics; cantharides, ether, chloroform, savin, mustard, mezereon, arnica, and turpentine; the tarry preparations, used locally—may cause dermatitis. Tartar emetic also occasions a vesicular and pustular eruption, particularly when used in the form of an ointment. Croton-oil applied to the skin produces similar lesions attended with edema, swelling, and often pain with itching; the severity of the lesions and symptoms depending upon the quantity of oil and the extent of frictions employed. Mercurials, especially the ointments, may likewise give rise to dermatitis, particularly if used carelessly, or upon a sensitive or susceptible skin. The many dyes (often containing arsenical compounds) used for coloring toys, hat and cap bands, under-garments, more especially flannel shirts and drawers and cheap colored hose, often produce violent inflammation. Normal and abnormal secretions, by their retention or contact with the skin, as an excessive secretion of sweat, excessive discharges from the bowels, the dripping of urine, the pus from gonorrhea, wounds, or other diseases may also produce similar inflammatory conditions.

The vegetable kingdom furnishes many substances which, when applied to the skin, occasion irritation and more or less severe inflammation. Among the plants that possess these properties are the nettle, the smart-weed, cowhage, and by far the most common the rhus family—the rhus venenata, the rhus toxicodendron ordinarily referred to as poisonous sumach or dogwood, or poison oak or ivy. In order to distinguish poisonous from harmless species it should be borne in mind that the three-leaved plant is dangerous, while the five-leaved is innocuous. The poisonous sumachs bear white berries; the red-berried varieties may be handled without harm.

The susceptibility to these plants varies in different individuals. Some can handle them with impunity; in others, the moment they come in contact with the plants, or even approach them, the most violent and severe inflammation of the skin appears in a few hours and in rare cases sometimes a day after. The disease usually begins in the hands, the lateral parts of the digits being first affected, and next the dorsal and palmar surfaces. From the hands it is most liable to pass to the parts with which they come in contact, as the face and genitalia. It may also spread to other or all parts of the body. The eruption generally appears in an erythematous form, accompanied by vesicles, pustules, and even abscesses, and attended with more or less edema, swelling, heat, and itching. The serous infiltration and swelling may at times be so great as to occasion great disfigurement, especially of the hands, arms, and genitalia. The lesions may be discrete or confluent. The vesicles are usually small, being situated upon an inflamed and edematous base, and often develop into pustules, which may rupture, the discharge drying into yellowish crusts. The affection may run an acute course in from one to six weeks. The period of recovery from it will, of course, vary according to the condition of the patient and the promptness with which treatment is instituted.

DERMATITIS CALORICA.—This variety of dermatitis is produced by extremes of heat and cold; and, inasmuch as both inflammatory conditions which they occasion are so common and require most careful treatment, they will, in due order, be described later under the titles of Combustio, or burn, and Congelatio, or frost-bite.

DERMATITIS ACTINOGENETICA OR X-RADIOUS.—Prolonged or frequent exposures to the rays from a Röntgen tube produce a peculiar form of inflammation of the skin. This is most evident in the hands and arms which are most often exposed to radiation. Some individuals appear to be more susceptible to this reaction than others. It is accompanied by loss of hair, glossy, red discoloration, and atrophy of the appendages of the skin. The destruction of tissue may proceed to necrosis and a deep slough may eventually separate, leaving a very inactive, granulating surface. The lesion may become affected by epithelioma, and amputation of the arms or legs may be required.

DERMATITIS MEDICAMENTOSA.—Many cutaneous eruptions of an inflammatory character are the result of the internal administration or the external application of drugs. Their occurrence is, however, not common, and is usually due to individual idiosyncrasy. The accompanying list of drugs[1] comprises most of those that have been observed to give rise to various disorders of the skin:

*Acidum Benzoicum*, taken internally or inhaled, may in exceptional cases produce an erythematous or small papular eruption. The same result occasionally follows the ingestion of benzoate of sodium.

*Acidum Boricum.*—An erythematous eruption, involving the face, trunk, and extremities, has been recorded from washing out the pleura with a solution of boric acid. Papules and blebs have likewise resulted from an injection of boric acid. Confluent rubeola-like eruptions, erythema, eczema, and generalized urticaria have also, in some instances, followed the internal use of large doses of boric acid.

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[1] For a more detailed account, see "Drug Eruptions," by Prince A. Morrow, A.M., M.D., New York: William Wood & Co., 1887.

*Acidum Carbolicum (Phenol)—Creosotum.*—Strong solutions of these remedies applied to the surface incite more or less violent dermatitis, characterized by erythema, edema, itching, and pain; used undiluted, they destroy the portions of the integument to which they are applied. (See also under "Phenol".)

*Acidum Nitricum*, when applied to the integument diluted, will produce a yellowish discoloration. Stronger applications give rise to a bullous eruption resembling pemphigus, and are occasionally employed for this purpose by hysterical women.

*Acidum Picricum.*—A case of violent dermatitis from picric acid has been described by Dr. v. Haesslin.[1] A man had bought a pair of shoes lined with orange-colored leather. After wearing them for about a week his feet began to itch intolerably; they were colored yellow, hot, and swollen. Innumerable vesicles formed and coalesced until the epidermis of both feet, as far as they had been covered by the shoes, was raised by a purulent serum. Some constitutional reaction was present. The leather was found to be saturated by picric acid. An intolerable and persistent urticaria was seen by Dr. C. H. Hughes, of St. Louis, Mo., to follow the administration of a few doses of picrate of ammonium. The sclerotic coat of the eyes likewise became yellow and the urine brownish-red. Meurice[2] reports a girl of fourteen had sustained a second degree burn, the diameter of the lesion being not more than an inch and a half, and within twenty hours of the application of a solution of picric acid she developed headache, vertigo, nausea and vomiting. Picric acid was recovered from the urine, which was brownish in color, and contained methemoglobin and abundant albumin. The symptoms gradually cleared up after the removal of the dressing.

*Acidum Pyrogallicum.*—The local use of pyrogallic acid may give rise to dermatitis of varying severity, and may produce extensive ulceration and sloughing.

*Acidum Salicylicum.*—Salicylic acid has been known at times to produce various cutaneous lesions. Thus, Heinlein reports a diffuse erythema on the left side of the face, chest, and lower extremities, with edema of the eyelids, lips, and legs, together with an intolerable itching and tingling of the skin, accompanied with fever, from large doses of salicylate of sodium. On decreasing the medicine the eruption disappeared, but on again renewing large doses an urticarial eruption appeared upon the greater part of the body. The eruption disappeared on the following day, and small doses of the drug did not occasion any relapse. Vesicles and pustules on the hands and feet, with much sweating, have also been recorded as due to the use of this drug. Ecchymotic patches have likewise been noticed on the back from the same cause.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, March, 1889, p. 116.

[2] Annales de la Société de médecine de Gand, 1907, p. 166.

*Acidum Tannicum.*—An erythematous eruption has been reported to follow from the injection, inhalation, and ingestion of tannic acid in a case recorded by Dr. Williamson. In some individuals the local application of tannic acid will provoke an attack of urticaria.

*Aconitum.*—A decided diaphoresis has sometimes followed the internal use of aconite, together with vesiculation and more or less itching. Its external application has also been attended with redness and the development of vesicles, pustules, and blebs.

*Alcohol.*—Dr. G. Kaempfer has published an account of a case of erythema following the ingestion of alcohol. The patient, under treatment for rheumatism, had been an excessive drinker. Half an hour after taking beer, whiskey, or brandy erythematous patches, of various size and differing in depth of color, appeared upon the surface. The smaller areas were more highly colored. The retinal vessels were swollen and the pharynx was intensely injected. The flush upon the skin began to fade half an hour after its development, and by the end of the hour had entirely disappeared. There was a subjective feeling of heat in the parts and the local temperature was nearly a degree above normal. The pulse was rapid. In this case it is presumable that alcoholic addiction had disturbed the equilibrium of the vaso-motor centres. The relationship between alcohol and rosacea has been referred to.

*Amygdala Amara.*—The ingestion of bitter almonds has been reported to produce an eruption similar to urticaria.

*Anacardium*, or the cashew-nut, when applied to the skin, produces violent dermatitis of an erysipelatous character.

*Antimonium.*—In some cases the internal administration of antimony has been followed by the development of wheals, papules, and pustules.

*Antipyrin.*—This drug is frequently productive of cutaneous disturbances. The eruption resulting from its use consists of numerous and widely disseminated erythematous spots, or small, hard, dark-red or purplish papules, and may simulate the exanthem of measles. At times the remedy gives rise to a scarlatiniform rash. It may also occasion vesicular and bullous lesions, or herpes on the lips. Severe urticaria has been produced by a single dose of five grains (0.30 gm.). It has been known to cause erosive glossitis simulating mucous patches.

*Argentum.*—The internal administration of silver salts, especially the nitrate, produces a condition known as argyria, in which there is a bluish or slate-colored pigmentation of the skin. This is caused by the deposit of the metal in the deep layer of the epithelium.

*Arnica.*—Notwithstanding the esteem in which arnica is held as a domestic panacea, its external use is frequently productive of violent erythematous and pustular eruptions. M. Dupuy has met with a case of pseudo-erysipelas produced by the application of tincture of arnica.

*Arsenic Trioxide.*—Erythematous, vesicular, bullous, papular, pustular, or ulcerative lesions may follow the ingestion or absorption through the skin of arsenic. The eruption may resemble syphilis, measles, erysipelas, or erythema multiforme. Occasionally it may be purpuric or urticarial in appearance. The use of arsenic will occasionally give rise to herpes zoster. Arsenic eruptions generally occur on the face, neck, and hands, and may disappear in one to two weeks after the remedy is discontinued. Pigmentation, of a brown color, occurring in patches, is caused by arsenic, especially on those parts of the body which are not exposed to the air (differing from Addison's disease).

*Balsamum Peruvianum.*—An erythematous, urticarial, or eczematous eruption may follow the application of this drug.

*Belladonna—Atropine.*—An erythematous or scarlatinoid rash may develop after either the internal or external use of belladonna or its alkaloid. It is one of the most common medicinal rashes, and very frequently appears within a very short time, often a few moments or an hour, after the employment of the drug. The efflorescence is accompanied with headache and dryness of the throat, but neither fever nor desquamation is observed. It is of more frequent occurrence among children than adults, probably owing to the drug being more largely administered to the former class. The eruption is mostly limited to the face, neck, and chest, but it may in rare cases involve the entire surface. In some instances papular, urticarial or purpuric lesions may be produced.

*Benzole.*—Lewin reports erythema from the application of this agent.

*Box.*—Dr. J. C. White has reported a severe case of dermatitis of the face produced by a decoction of garden-box, which a young woman had applied to her scalp for the purpose of preventing loss of hair. The liquid ran down upon her face. The scalp was not affected.

*Bromine—Bromides.*—The eruption produced by the bromides, especially the potassium and ammonium bromides,[1] usually consists of acne or acneiform furuncles, first developing on the face, neck, chest, and back. Vesicles and pustules may appear at the same time, with occasionally an erythematous efflorescence, or brownish discoloration, the eruption assuming now the appearance of eczema, and again resembling the papular syphiloderm. Wheals and ulcers have also been known to follow the use of these preparations. The eruption may appear within twenty-four to forty-eight hours after the administration of the drug, but usually it develops only after the system has been saturated with it. The use of small doses of arsenic with the bromide frequently prevents the development of the lesions. In some instances the lesions appear to assume a malignant aspect. Dr. Beevor[1] met with a case in which there occurred upon the arms of a child the usual acne form, which soon took on the appearance of a varicella, being ultimately transformed into warty growths resembling condylomata. A vegetative or fungous or warty growth, has been reported from prolonged administration in a child seven and one-half years old. The lesion is in large patches, elevated, with offensive secretion, resembling a brown crust (yellow, brown or black), leaving a cicatrix after healing. It disappears rapidly on stopping bromide. A bromide eruption occasionally shows itself upon a suckling infant whose mother is upon a course of bromide treatment.

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[1] The ammonium bromide, according to Ringer, is most active in producing bromide eruption.

*Calx Sulphurata.*—The sulphide of calcium given internally may sometimes produce vesicles, pustules, and furuncles.

*Cannabis Indica.*—A papula-vesicular eruption, covering almost the entire body, has been reported by Hyde, after a patient had taken one grain (0.06 gm.) of the drug. The pruritus was marked, but all the symptoms disappeared in a few days.

*Cantharis.*—The vesicating qualities of this drug render it invaluable in many affections where counter-irritation or derivation is requisite, but it occasionally produces obstinate and extensive ulceration.

*Capsicum.*—The external use of capsicum is sometimes followed by erythema and a mild form of dermatitis.

*Carbolic Acid.*—(See Phenol).

*Chloral.*—An erythematous or scarlatiniform eruption may result from the use of chloral hydrate. The lesions appear usually on the face, neck, chest, and extremities, and are especially liable to develop when the drug is administered with stimulants. The administration of chloral may occasion fever, with tenderness of the skin, glandular enlargement, or wheals; papules, vesicles, pustules, even petechia and ulceration may appear, and in toxic doses be followed by symptoms of purpura hemorrhagica and death.

*Chloralamide.*—Dr. Pye-Smith relates[2] a case in which eighty grains (5.20 gm.) of this hypnotic, given in two doses of forty grains (2.60 gm.) each at eight hours' interval, gave rise to severe universal dermatitis. Fever lasted a week, the urine was slightly albuminous, and profuse desquamation followed, resembling that of exfoliative dermatitis.

*Chlorine.*—Dr. J. C. White has met with a case of dermatitis due to chlorine. A school-girl, aged eighteen, had turned hydrochloric acid upon black oxide of manganese in a jar, and the gas thus generated had come in contact with her face held just above the vessel. The inflammation extended from the middle of the forehead down the neck as low as the level of the dress.

*Chrysarobin*, chrysophanic acid, or Goa powder, is extremely irritant to the integument, producing edema, accompanied by the formation of nodules, pustules, and large vesicles. Vidal, Morris, and Blaine have observed dermatitis exfoliativa following applications of chrysarobin.

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[1] La Semaine Médicale, March 31, 1907.

[2] Lancet, March 9, 1890.

*Cinchona—Quininæ Sulphas.*—Quinine may give rise to an erythematous eruption, resembling at one time scarlet-fever rash, and again measles or erysipelas. It may occur from small doses, and may or may not be preceded or accompanied by the well-known symptoms of cinchonism. The eruption first appears upon the face, especially around the eyes, which are much swollen. It also extends to the scalp and neck, and spreads until all the body is invaded. The local symptoms of burning and itching are very intense. It is not attended by fever. The eruption terminates in desquamation which may continue for some time. Papular, bullous, and purpuric forms have also been recorded. Rashes are also provoked by the direct action of cinchona. Workmen employed in preparing quinine are subject to erythema, vesicles, or pustules upon the face, arms, forearms, and genitals.

*Coal-tar Preparations.*—These frequently cause erythematous, papular and urticarial lesions, and have been known to produce permanent pigmentation.

*Condurango.*—According to Guntz, furuncular and acneiform lesions have developed after the administration of condurango for the treatment of syphilis.

*Conium.*—An erythematous or papular eruption with diaphoresis may result from the administration of this drug.

*Copaiba.*—A bright-red papular or maculo-papular rash, with intense itching, may appear from the ingestion of copaiba. It resembles urticaria and erythema multiforme, and occurs by preference on the extremities, but may involve all the body. The eruption may appear immediately after the medicine has been taken, or, in rare cases, a long time after its employment. In one case under my observation, the eruption, covering the entire body of a college student, was mistaken for small-pox. Within a few days the eruption subsided with the discontinuance of the drug, as it will in all cases, and my diagnosis was verified. A bullous eruption has also been seen to follow the administration of copaiba.

*Creolin.*—Dr. J. Wackez reports that in a series of seventeen cases of incised and lacerated wounds occurring in children he employed a 1:1,000 dilution of creolin as a local remedy. In seven of the patients a more or less severe eczema appeared upon the third day. The temperature was raised, the neighboring lymphatic glands swollen, there was loss of appetite, headache, and frequent vomiting. The urine showed elimination of phenol and an increase in the aromatic ethereal sulphuric-acid compounds.[1]

*Cubeba.*—A bright-red discoloration of the skin, with millet-seed papules, coalescing in spots, involving the face, arms, trunk, and limbs to a slight extent, has been recorded from the ingestion of cubeb berries. The eruption occurs mostly in young subjects after the use of large quantities of the drug. It disappears in a few days after the cubeb has been discontinued, but may be followed by a furfuraceous desquamation.

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[1] Therapeutic Gazette, August 15, 1889.

*Digitalis.*—The internal and external uses of digitalis have been known to produce an erythematous, papular, and even an erysipelatous eruption. Morrow reports an erythematous efflorescence followed by urticaria from the administration of infusion of digitalis with acetate of potassium.

*Dulcamara.*—In susceptible subjects, large doses of dulcamara produce a diffused but temporary scarlatiniform efflorescence.

*Ergot.*—A vesicular, pustular, and furuncular eruption, with petechia, has been known to result from the prolonged ingestion of ergot. Gangrene of the skin has also been observed.

*Ferrum.*—The internal use of iron will at times develop an acneiform eruption.

*Hydrargyrum—Mercury.*—The administration of small doses of mercury may occasionally produce a partial or general deep-red eruption. The region attacked is ordinarily the face, but it may spread over part or all of the surface. The skin is smooth, shining, dry, itchy, and has very much the appearance of being attacked by erysipelas. Eleven hours after a subcutaneous injection of calomel Lesser saw the skin of the entire body assume a scarlet color. This began to fade on the second or third day while desquamation began on the fifth day, and subsequently involved the entire epidermis. Guelpa speaks of a case in which a variola-like eruption followed the use, in a primipara, of a one-half-per-cent. sublimate solution used as a vaginal wash, conjoined with the application of a mercurial ointment to the abdomen. Dr. John A. Fordyce observed a case of scarlatiniform erythema, followed by desquamation, caused by the application of mercurial ointment. Similar cases have been reported from exposure to the fumes of mercury. Patients who are taking mercury internally are especially subject to the toxic influence of iodoform, when the latter is dusted on the surface of the skin.

*Hyoscyamus.*—Hyoscyamus may produce a scarlatiniform eruption, which disappears as soon as the drug is eliminated.

*Iodine, Iodides, and Iodoform.*—Erythematous, papular, vesicular, bullous, vesico-pustular, pustular, and purpuric lesions have been caused by the administration of these medicines. The erythematous form, which is not rare, develops generally upon the forearms, face, and neck. An eruption which took the form of erythema nodosum is reported by Lesser as making its appearance after two days' internal use of iodide of potassium. The papular and vesicular forms, which are not so common, are usually the result of long-continued use of these drugs. The lesions usually occur on the chest and limbs, as well as on the scalp and scrotum, and are attended with severe itching. Occasionally, but very rarely, there is an idiosyncrasy against the drug, and a dose as small as five grains, given to a man three times a day, has produced in the third day, a general vesicular rash resembling varicella, but not attended by rise of temperature. Edema of the glottis has also appeared after the administration of ordinary doses of potassium iodide.[1] An eczematous eruption, with high inflammatory, constitutional, and local symptoms, has also been recorded from the ingestion of small doses of the iodides. The pustular form is the one most commonly met with; it resembles, both in appearance and location, the eruption produced by potassium bromide. It is commonly acneiform, and develops upon the face, shoulders, back, chest, and arms. On examination, iodine has been detected in the pus. Occasionally both the iodide and bromide of potassium are productive of furuncles. The bullous form has been observed principally upon the head, neck, and upper extremities, although instances are mentioned of its occurring on the lower extremities, and the trunk, but rarely in the mouth. The eruption may begin as small vesicles or papules, which remain so, or slowly become, especially if the drug be persisted in, bullous, containing serous fluid, or becoming purulent or sanguinolent. Hallopeau has witnessed a case in which occurred a consecutive production of bullæ, depressed cicatrices, and condylomatous vegetations, together with serious ocular lesions. The outbreaks were accompanied by fever and diarrhea. Russell observed a case in which death occurred upon the tenth day from inanition and a low grade of pneumonia. Purpura may also follow the use of iodine or the iodides. It generally occurs on the legs, and may assume the hemorrhagic form and terminate fatally. Besnier had a patient in whom iodide of potassium caused purpura, but who could take tincture of iodine with impunity.

Dr. R. W. Taylor, of New York, described a very remarkable case of iodic eruption in which, after the administration of increasingly large doses of iodide of potassium to a young man, a number of tumors appeared upon the face. The excrescences were of a deep-red color, varied from the size of a three-cent piece to that of a quarter of a dollar, of oval or rounded outline, pedunculated, and sessile. The surfaces were papillomatous, and the orifices of the sebaceous ducts exhibited trumpet-shaped dilatations from which a small quantity of pus could be expressed. So fungous were some of the growths that they assumed the form of mushrooms. All lesions usually disappear rapidly within a few days after the iodine or iodides have been discontinued. A case of generalized urticaria due to the local use of iodoform has been reported. A purpuric eruption has been occasioned by the internal employment of iodoform. Erythema has been caused by local application of europhen.

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[1] See Author's "Materia Medica and Therapeutics," seventh edition.

*Ipecacuanha.*—This drug, when placed in contact with the skin, is productive of erythema, papules, and pustules. Its ingestion is occasionally followed by outbreaks of urticaria.

*Linum.*—Workers in flax are apt to be attacked by eczema.

*Matico.*—Erythema may result from the use of matico.

*Naphthalin.*—This substance has been known to excite a generalized, morbilliform, papular eruption, which soon disappeared after withdrawal of the drug, and was followed by desquamation.

*Olea—Fats.*—Oils and fats, especially codliver oil, occasionally after ingestion produce erythematous or acneiform lesions.

*Oleum Ricini.*—When this oil is accidentally or designedly substituted for olive-oil in preparations for internal or external use, erythema and pruritus may result.

*Oleum Tiglii.*—The pustulating properties of croton-oil are well known, but occasionally the pustules become the initial point of an obstinate ulcerative process.

*Opium—Morphine.*—An erythematous eruption, resembling that of scarlet fever, may occur after the internal use of opium and its alkaloids. In other cases the employment of these preparations may simply give rise to an intolerable itching, without any efflorescence, or there may develop an urticarial efflorescence, with heat and itching, or only a profuse sweating and sudamina may appear. The eruption, if mild, may disappear in the course of a few hours, or, if severe, it may continue longer and be succeeded by desquamation.

*Orange.*—Painful erythema, edema, vesicles, and pustules are sometimes produced by paring bitter oranges (citrus vulgaris).

*Petroleum.*—The workmen in petroleum refineries are apt to become subject to acne of the scalp, face, trunk, and limbs. Those who are careless and uncleanly are especially affected. Edema of eyelids is common.

*Phenol.*—When used as a moist dressing on a compress, even very dilute solutions of carbolic acid will cause gangrene of the fingers or toes, which may be limited to the skin, or cause death of the part and sloughing. Strong solutions all coagulate albumin and cause local gangrene of the skin of parts to which they are applied.

*Phosphorus—Phosphoric Acid.*—Phosphorus will occasionally develop purpura with fatal result. A bullous eruption resembling pemphigus has been observed to follow the use of phosphoric acid.

*Pix Liquida—Turpentine.*—Erythematous, vesicular, and papular eruptions, mostly occurring on the face and trunk, accompanied with intense itching, occasionally follow the internal use of tar and turpentine, and their various products. In a case narrated by Dr. Feiber, of Aix-la-Chapelle, the administration of turpentine for several days was followed by a papular eczema with severe itching. A repetition of the drug caused the development of a mixed form of edematous and papular erythema.

*Plumbum.*—The salts of lead used internally may produce an erythematous eruption or petechia. Their external application may also result in brownish or blackish discolorations of the skin.

*Podophyllum Peltatum.*—More or less inflammatory irritation of the scrotum has been observed by Winterburn in those who work with the resinoid podophyllin.

*Potassii Bicarbonas.*—This salt has, in rare instances, given rise to a vesicular eruption resembling eczema.

*Potassii Bichromas.*—Workmen engaged in manufacturing this salt, or using dyes in which it is an ingredient, are frequently attacked by papular and pustular eruptions, succeeded by ulceration and sloughing. M. Ridant has met with eczema of the hands in workmen as a result of the bichromate solution used in dyeing cloth. The dye is made by adding sulphuric acid to a solution of bichromate of potassium. A certain proportion of the chromic is displaced by the sulphuric acid, and the solution therefore contains free chromic acid in addition to the bichromate of potassium. The wearing of garments dyed with this substance is a not uncommon cause of ulcerative dermatitis.

*Potassii Chloras.*—An erythematous and papular eruption has been reported to follow the internal use of chlorate of potassium.

*Quinina.*—(See Cinchona).

*Rheum.*—Dr. Litten, of Berlin, has reported the case of a man who had been attacked by a rash several times after taking rhubarb. The eruption consisted of large hemorrhagic maculæ together with pustules and blebs. The latter ran together in many places so that large patches resembling pemphigus foliaceus were produced. All the visible mucous membranes were likewise affected. Free hemorrhage occurred from the urethra.

*Santoninum.*—Urticaria with swelling of the face and edema of the eyelids has been recorded from giving a child three grains of santonin. In a case observed by Underwood a morbilliform eruption, with a punctiform rash on the buccal and pharyngeal mucous membrane occurred.

*Sodii Benzoas.*—An erythematous eruption, attended with itching and desquamation, was reported by Rohé after ingestion of sodium benzoate.

*Sodii Boras.*—An eruption similar to psoriasis, occurring on the arms, trunk, and legs, has been reported by Gowers from the employment of borax. The use of arsenic with the above salt caused the eruption to fade in two cases of the three reported. Féré and Lamy have, in two instances, seen eczema result from the internal administration of borax. The patients, who were epileptics, had taken in one case two grammes (31 grains), and in the other three grammes (46½ grains) daily. The eruption was limited to the sides of the trunk and to the arms, lasted about six weeks, and disappeared on cessation of the remedy.

*Sodii Salicylas.*—Dr. Cavafy[1] testifies to having seen free desquamation follow an erythematous eruption due to salicylat of sodium. Salol has given rise to urticaria or a rash resembling herpes zoster.

*Stramonium.*—An erythematous eruption, simulating the efflorescence of scarlet fever, has frequently been observed during the administration of datura stramonium.

*Strychnine.*—A scarlatiniform eruption has been noticed even after the use of one twenty-fourth of a grain of strychnine (0.0025 gm.).

*Sulphonal.*—This drug has given rise to troublesome general pruritus and a scarlet-red erythema, accompanied by burning and intense itching. A generalized bullous eruption was observed by Leick.

*Sulphur.*—Sulphur, when taken internally or applied externally, may be the exciting cause of erythema, papules, and pustules.

*Tanacetum.*—Hyde cites Porter's case in which a varioliform eruption developed after the ingestion of a drachm and a half (6 gm.) of oil of tansy.

*Thapsia.*—Thapsia applied externally produces intense dermatitis, followed by pustulation.

*Vanilla.*—Brocq and Fage[2] presented to the French Society of Dermatology and Syphiligraphy a woman with an edematous erythematopapular eruption which was due to having packed vanilla for ten days. Almost all the women who had worked in the same shop had had analogous eruptions. The lesions were found on the face, the neck, the chest, the forearms and the hands. At the end of ten days the eruption had left no traces, except a dusky color of the skin. The patient went back to work and had a recurrence of the eruption. Brocq visited the shop and made a thorough inspection during which he experienced tingling sensations on his face, neck, and hands. The tingling disappeared, however, after he left the shop. Several authors who have described this eruption believed that it was due to an animal parasite, but the vanilla bean itself seems to play an important rôle in its production.

*Veratria.*—An erythematous, pustular, and at times a petechial rash may follow the application of veratria to the skin.

*Veratrum Viride.*—An erythematous and even a pustular eruption has been known to follow the internal use of veratrum viride.

*Veronal.*—Cutaneous eruptions have been reported following the administration of veronal.[3] Paul G. Woolley, of Bangkok, Siam, reports a personal experience in the "Journal of the American Medical Association," (Dec. 23, 1907, p. 2153). On the day following a dose of seven grains, taken to relieve insomnia, he noticed a slightly tender, somewhat itchy, erythematous macule over the first metacarpo-phalangeal joint of the left hand. The day following the lesion had become rather swollen and raised above the surrounding skin and was of a brilliant red color and felt tense and a little sore. A day or two later the surface of this maculo-papule, which measured 2x1½ cm., was covered with a number of small vesicles. Later still the vesicles dried and desquamation occurred, leaving a livid purple surface that turned to brown and then gradually faded to normal.

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[1] Lancet, April 21, 1883.

[2] La Tribune Medicale, Jan., 1907.

[3] "Case of Veronal Dermatitis;" H. B. Ormsby, Cleveland, Ohio; Medical Journal, January, 1908.

He subsequently found that the lesion was reproduced after taking this remedy. He made the experiment four times in eight months and always with the same result. There were no other symptoms, and the eruption did not follow when sulphonal or trional were taken in place of veronal. Bulkley[1] has also reported a similar case.

*Violet Water.*—Dr. J. C. White met with a case in which a bright-red, finely papular rash of sharply defined outline was produced upon the breast of a young girl by the local application of violet toilet-water. The preparation used smelled strongly of orris-root, which possesses decidedly irritant properties.

**Diagnosis.**—The diagnosis in almost all the varieties of dermatitis largely depends upon the history of the case.[2] Care should always be exercised to detect the distinction, if possible, between genuine eruptions and those which are produced with a view to deception. If the eruptions are simulated, they will be found to occur usually upon regions of the body which are easily reached by the hands, and more particularly in hysterical women.

The diagnosis of the many medicinal eruptions referred to is often very difficult, and if fraud be suspected a most careful examination of the history and mode of living of the patient should be made. A medicinal rash may be suspected when the eruption appears suddenly, and particularly when a variety of lesions occur. Again, the wide diffusion of the eruption, its presence upon exposed and protected parts, the attendance of itching and absence usually of fever, together with the knowledge that the patient is taking some substance upon the decrease or removal of which the rash suddenly disappears, furnish sufficient evidence for the diagnosis.

**Treatment.**—Internal medication in dermatitis is necessary only in a few cases. The free use of alkalies, in the form of the natural waters, is often valuable in some, while in others the tincture of the chloride of iron acts promptly in giving relief. Antipyretics and tonics may be especially serviceable in rhus-poisoning and other similar conditions arising from contact with vegetable substances. Iodide eruptions may often be prevented or relieved by drinking freely of water. The local treatment in all varieties of dermatitis is the same as that already suggested for acute eczema. Soothing and astringent lotions in the beginning of the eruption, and, later, bland and slightly stimulating ointments, with or without the ordinary dusting-powders, are indicated. Lotions of lead-water and laudanum, tincture of witch-hazel and water, black-wash, bicarbonate of sodium and borax, alone or combined in the form of solution, are all most useful applications. Boric acid or subnitrate of bismuth, one drachm ( 4 gm.) of either to the ounce (32 gm.) of simple ointment, will be serviceable in many cases, and the same may be said of ointments containing oxide of zinc or calamine, erythroxylon, aluminium oleate, glycerin of subacetate of lead, nitrate of lead, or sozoidol. The addition of a small quantity of betanaphthol or sulphur, or both, to the ointment is often of advantage. The use of weak mercurial ointments will frequently be efficacious, especially in the later stage of the eruption.

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[1] Journal of the American Medical Association, 1907, p. 1864.

[2] "On the Diagnosis of the Commoner Drug Eruptions," by William S. Gottheil; Archives of Diagnosis, April, 1908, New York.

RHUS-POISONING.—Abel and others have shown that the active principle can be entirely freed from proteid, and that it is a glucoside. Recently experiments by Ford seem to prove that a definite immunity can be established, in animals, against this poison. The blood of these animals, when injected into other animals, is able to protect the latter from many times the fatal dose. This suggests the possibility of a serum treatment for rhus-poisoning. This variety of dermatitis often requires the most active local treatment. If the lotions already recommended fail to alleviate the suffering and remove the eruption, recourse may be had to one to six drachms (4 to 24 gm.) of hyposulphite of soda to the quart (1024 gm.) of water, used constantly on the inflamed parts. Decoctions of white or black oak-bark, black alder, or geranium, will prove of value. From one-half to one drachm (2 to 4 gm.) of the fluid extract of grindelia, with four to six ounces ( 128 to 192 gm.) of water, has been highly extolled. Dr. S. B. Straley, of Huntsville, N. J., reports[1] very favorably of the use of a strong decoction of chestnut leaves, bathing the inflamed parts every three or four hours. He states that the inflammation is allayed in from twenty-four to seventy-two hours. Dr. J. J. Levick, of Philadelphia, derived decided advantage from dusting the surface freely with powdered thymol iodide. Lime water or Labarraque's solution may likewise be advantageously applied. The earth treatment, or the use of fresh clay, (Cataplasma Kaolini) will act most successfully in many cases. According to Hyde, an ointment of great value can be made "by incorporating a decoction of the inner bark of the American spice-bush (Benzoin odoriferum) with cold cream." Undiluted yellow wash will often have a good effect.[2]

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[1] Times and Register, November 22, 1890.

[2] See paper by Dr. Joseph H. Hunt, in Brooklyn Medical Journal, June, 1897.

Dermatitis Actinica.—In the treatment of burns from the x-rays, Engman has found that lanolin, applied for twenty-four hours and followed by a slightly astringent ointment prepared as follows, is very effective:

| | |
|---|---|
| ℞ Acid. borici | ℥jss. |
| Zinci oxidi, | |
| Bismuthi subnitrat., | |
| Pulv. amyli | āā ℥j. |
| Ol. olivæ, | |
| Aquæ calcis | āā f℥iij. |
| Adipis lanæ | ℥j. |
| Aquæ rosæ | ℥jss. |

M. Ft. emulsio. Sig.: Apply to affected area.

Weak phenol solutions or ointment (3 per cent.) may be applied to any part except the fingers; or, if applied to the hands, the phenol solution should be neutralized by alcohol, and the above ointment then be applied once daily.

Medicinal Eruptions may often be prevented or relieved by simple hot air or steam baths, the Turkish being preferable. Baths eliminate the drug, and prevent or lessen its irritating action. Soothing and slightly stimulating ointments are of advantage. The lesions resulting from arsenic are relieved by a weak ointment of iron oleate, from ten to sixty grains (0.60 to 4 gm.) to an ounce (32 gm.) of lard. Bromine and bromide eruptions may be alleviated by the free application of a solution of salicylic acid, one grain (0.06 gm.) to the ounce (32 gm.) of water, as recommended by Prowse. M. Ch. Féré has called attention to the value of intestinal antiseptics in the treatment or prevention of bromism. All the symptoms, and especially the cutaneous manifestations disappear. Antisepsis by means of naphthol and salicylate of bismuth may be continued for months without evil consequences. In several cases M. Féré has been able to administer as much as four to four and one-half drachms (16 to 18 gm.) of the bromide daily without detriment to the general health. He states that this method is equally advantageous to those under treatment by borax. Arsenic and the sulphide of calcium have been recommended as having some antidotical influence against the action of the bromides; arsenic, belladonna, atropine, and Vichy water, against the effects of iodine. Hydrobromic acid is considered to be beneficial in the case of dermatitis due to cinchona or quinine, sulphur in that produced by pyrogallic acid and chrysarobin. The mineral acids, likewise, according to Unna, are useful in neutralizing the effects of pyrogallic acid and chrysarobin. For iodoform rashes Dr. Wicheskiewicz recommends gauze compresses soaked in a solution of one part of tannin in three of glycerin. The dressing is covered with waterproof paper. He also advises that for several days after the eruption has disappeared the parts be covered by a two-per-cent. boric-acid ointment.

When the irritant is of acid reaction its effects will generally be best relieved by an alkaline application, whereas an acid remedy, such as vinegar, boric or phenol, is preferably employed to counteract the consequences of an alkali.

DERMATITIS EPIDEMICA.—Dr. Thomas D. Savill,[1] of London, Medical Superintendent of the Paddington Infirmary, has described an eruptive disorder which he had observed in that institution. The lesions were accompanied by constitutional manifestations. The cases were 163 in number, being nineteen per cent. of the inmates of the infirmary and sick-wards of the adjacent work-house. Examples of the same malady also occurred at the Marylebone Infirmary, St. Mary's Hospital, Western General Dispensary,[2] and at other places.

**Symptoms.**—The characteristic eruption was a dermatitis, at times attended by the formation of vesicles, and in other instances free from any obvious exudation—a dermatitis humida, and a dermatitis sicca. Most of the cases belonged to the moist variety. A few presented a mixed type, the several varieties being simultaneously present upon different portions of the body. The moist generally ran a more rapid course than the dry form, and the quantity of exudation was at times profuse. Intense burning and itching accompanied the eruption. The onset was often rather abrupt. Considerable variation was observed in different cases in regard to the extent and distribution of the rash. The eruption frequently began upon the flexures of the joints and between folds of the skin, as the mammæ and behind the ears. It was often first seen upon the face. The parts first attacked did not, however, correspond to those which are most open to the action of local irritants. Some patients suffered from conjunctivitis with edema of the eyelids. The first manifestation usually appeared in the form of papules, the intervening skin being erythematous. Some of the cases began with the formation of serpiginous rings. The eruption sometimes remained localized within narrow limits, while in others it covered an extensive surface or even became universal. The invaded skin was decidedly thickened, especially in the more severe cases. Fissures often resulted. In many of the cases the cervical glands were enlarged. Desquamation in the form of scales or flakes followed the fading of the rash. In one case the entire cuticle of the palm and palmar surface of the fingers was shed. Falling of the hair took place in some instances even when the scalp had not been implicated. Desquamation also occurred in parts which had not been the seat of eruption. In some cases the nails were lost. Recrudescence of the rash was sometimes observed after the skin had begun to heal, but true relapse was infrequent. Most of the patients presented marked constitutional disturbance, without, as a rule, the occurrence of fever. The temperature was not raised except when the eruption reached its height and covered a large surface. With this exception the temperature was apt to be below normal. The gravity of the systemic manifestations corresponded to the extent of the rash. The appetite failed and the strength diminished. The tongue, generally coated in the beginning, subsequently lost its epithelium. Vomiting, diarrhea, and muscular tremors accompanied some cases. In one, wrist-drop and suppression of urine preceded death for a few days. Albuminuria occurred in about half the cases. Serious maladies, such as meningitis and gangrene of the feet sometimes existed as complications. The disease proved fatal in 12.8 per cent. of the cases. The immediate cause of death was, as a rule, asthenia, but in some instances it was preceded by coma. The duration of the malady was from six to eight weeks.

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[1] British Medical Journal, Dec. 5, 1891.

[2] British Medical Journal, Jan. 30, 1892.

**Diagnosis.**—The gradual development, absence of fever, the formation of vesicles upon some parts of the body, distinguished this affection from erysipelas. Some cases began with scattered macules, which bore a strong resemblance to those of rötheln, but the persistent nature of the rash, its subsequent scaly character, and the apyrexia, were features in which the malady differed from rötheln. The disease presented a much closer likeness to pityriasis, but the epidemic character, the preference for old people, and the moisture of its lesion, are thought by Dr. Savill to constitute it an independent disorder. From eczema he would separate the affection by the following points: The greater thickening and inflammation of the skin, the exfoliation of large flakes, the definite course, the age of the patients, and its epidemic nature.

**Pathology.**—The lesion was an inflammation of the derma. A considerable effusion of cells and fluid was interposed between the derm and epiderm. Even in the dry form secretion could, by the aid of a lens, be discovered upon the under surface of the flakes. The changes in the derma consisted, in the earlier stage, of a large excess of leucocytes; in the later stage, of a large excess of fibrous tissue. In most of the fatal cases hypostatic congestion of the lungs was found.

**Etiology.**—Age was a predisposing cause, most of the sufferers being in advanced life. Children, though exposed to the same influences, usually escaped. Men were more subject to attack than women, and the disease was, in males, more severe and more frequently fatal. Occupation seemed to furnish no predisposition. Previous ill health had a decided influence in its production. The greatest number of cases occurred in July and August.

The epidemic and in all probability contagious nature of the disorder suggested that it might depend upon the activity of a micro-organism. Serum taken from the lesions was examined under the microscope and numerous culture experiments were made. Cocci were abundantly present in the serum. Their appearance was that of the staphylococci, but certain peculiarities in their mode of growth left it uncertain whether they should be considered identical with that organism.

**Treatment.**—Local measures proved of but little avail. When once established the lesions seemed unamenable to treatment. In an early stage of development antiseptic applications, such as creolin, were beneficial. It was noticed in some cases that patches did not enlarge if covered with collodion. Tonic and stimulant remedies were demanded on account of the depression, and it was necessary to promote elimination by reason of the tendency to renal failure.

## DERMATITIS GANGRENOSA.

SYNONYMS.—Sphaceloderma—Sloughing of skin.

An idiopathic and a symptomatic dermatitis, ending in gangrene. It may appear either in the form of diffused or circumscribed patches. The idiopathic variety, which inclines to be symmetrical, may begin in some cases as large or small, circular, reddish or purplish hyperesthetic or anesthetic spots. In other cases it may appear in the early stages as hemorrhagic macules, or as spots presenting a white, parchment, or alabaster appearance.

Fagge, Brodie, Stockwell, Charcot, Rooke, Petri, Leloir, Déjérine, and others, have reported many interesting cases of this form of dermatitis. It has been known to follow various cerebral, spinal and nervous diseases, and also diabetes and cachexia.[1] Instances have been recorded in which this variety of dermatitis has been produced by certain substances, chiefly caustics, for the purpose of deception.

Gangrene of the skin may be single or multiple, simple or complicated by lesions of deeper structures.

**Symptoms.**—Necrosis of the deeper layers of the skin is shown by lividity of color, lowered temperature, absence of sensation, and invasion by micro-organisms. It may occur during the course of debilitating disease such as typhoid fever, or diabetes. It is very likely to occur in children in varicella, pemphigus and ecthyma, and in these cases it is multiple in character. This has received the special title of dermatitis gangrenosa infantum. Cases have also been recorded as following tuberculosis, rickets and syphilis. The lesions appear on the head, shoulders and trunk, and are covered with crusts, which subsequently are thrown off, leaving ulcers, split pea sized or larger, some of which may coalesce. These heal by granulation.

**Etiology.**—The tissues of the skin under certain circumstances become good culture grounds for bacteria. Gangrene may be produced by traumatism, excessive cold, burns, caustics, or x-ray exposure. Applications of phenol, even in weak solution, cause gangrene of the fingers. The local circulation may be affected by the administration of ergot, or by the action of infectious disease, and disorders of the blood-vessels, or compression of vessels by ligatures or new growths. In Raynaud's disease gangrene of the fingers and ears may be produced by local spasm of the vessels. Bed sores may similarly be caused by debility, or nervous disease. Malarial poison and diphtheria may also cause gangrene.

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[1] Dr. A. Douglas Heath, of Birmingham, describes in the British Medical Journal for June 3, 1897, a fatal case affecting the scalp of a child who had suffered from whooping-cough for six weeks.

**Diagnosis.**—Feigned eruptions may be excluded by their history. Ecthyma and pemphigus are vesicular in character, but exceptionally may be complicated with gangrene. *Senile gangrene* usually affects the lower extremities, and attacks the deeper structures as well as the skin, causing death of the part involved.

**Treatment.**—The local treatment consists in mild antiseptic solutions, dusting-powders, and warm compresses to stimulate the circulation. Internally good food and stimulants are required. Sunlight has a favorable effect. Restorative treatment is required.

X-ray gangrene is preceded by dermatitis, and may be treated by a modified carron oil (made with olive oil and lime water), or the solution of lead water and laudanum if there is pain. Engmann recommends a paste composed of: Boric acid, ʒxij (48 gm.); zinc oxide, starch, bismuth subnitrate and olive oil of each, ℥j (30 gm.); lime water and purified wool-fat, of each, ℥iij (90 gm.); rose water, ʒxij (48 gm.). When properly made this forms a light, creamy paste, which should be thickly spread on a gauze compress. This may be covered with a rubber tissue to prevent evaporation. Deep seated ulcers may require a surgical operation to remove the sloughing material. Large surfaces may be aided in healing by skin grafting.

**Prognosis.**—In young children, multiple gangrene of the skin is generally fatal.

GANGRENE AFFECTING THE GENITALIA.—A spontaneous form of gangrene of the penis has been described by Fournier. This condition followed pruriginous or other papules of the organ, which had been scratched or irritated by the finger nails. The gangrenous change in this condition is preceded by a dull red discoloration of the part, which may extend to the glans. It is attended by vesiculation, swelling and often by lymphangitis and erysipelas (Hyde and Montgomery). A similar condition may attack the vulva of hysterical women. These lesions have been described also under the caption of erythema gangrenosum.

The disease occurring in the tropics known as "Ulcerating Granuloma of the Pudenda," is contagious, autoinoculable and frequently venereal in its origin, but is not syphilitic. It is not attended by bubo, nor by constitutional symptoms. It is essentially a granuloma and has a warty appearance, and is followed by nodulated scar formation.

The parts most affected are the labia and vagina, and in men the penis and scrotum. Both sexes may have lesions in the ano-rectal region, or the groin. Manson described the affected part as "an area of white, or irregularly pigmented, perhaps excoriated, contracting folded, and dense cicatrix surrounded by a narrow serpiginous irregular border of nodulated, somewhat raised, red glazed, or pinkish, delicately skinned, superficially ulcerated, or cracked new growth." There may be a slight offensive discharge. The disease is exceedingly slow and chronic in its course, and has no tendency to spontaneous healing. The histology of the disease is unknown. It is often accompanied by anemia and cachexia. The poison of chancroid may cause destructive phagedena of the genitals.

**Treatment.**—The persistent use of soap and hot water followed by talcum or stearate of zinc may afford some relief. The continuous bath would have a good effect. The thickened cicatrix may be removed surgically.

Wood reports[1] eight cases of symmetrical gangrene of the skin of apparently malarial origin, and concludes that malaria may be considered a direct or provocative agent in symmetrical gangrene. The skin lesion differs from that found in Raynaud's disease. Tertian and quartan malaria may occur simultaneously, but such a combination is very rare. Usually one type predominates. Latent tertian fever is unusual, as described in Wood's cases with tertian and quartan malaria occurring in a patient with symmetrical gangrene. (See also "Diphtheria Spots on the Skin.")

## COMBUSTIO.

SYNONYMS.—Dermatitis combustionis—Burns—Scalds.

Burns and scalds are traumatic, often necrotic inflammations of the skin frequently involving the deeper structures, the former being due to the action of dry, and the latter to that of moist heat.

**Symptoms.**—Burns may be divided, according to their degree of severity, into three varieties: dermatitis ambustionis erythematosa, dermatitis ambustionis bullosa, and dermatitis ambustionis escharotica.

DERMATITIS AMBUSTIONIS ERYTHEMATOSA.—The erythematous variety is the result of exposure to the summer sun or x-rays, steam, flame, ignited gases, heated solids or liquids. The surface is reddened, slightly swollen, painful, and may be the seat of a few small vesicles. All the symptoms may disappear in a few days, to be succeeded by more or less desquamation or sloughing of the epidermis.

Dr. Robert Bowles, from a study of sun-burn in the presence of snow, concludes that the effects are due to the radiation of violet or ultra-violet rays from the surface of the snow. These act like other actinic rays in passing through the epithelial layers of fair skin. The action upon the integument may be prevented by painting the face brown or wearing a brown veil. Dermatitis is frequently caused by exposure to the Röntgen rays. Pigmentation, and swelling of the skin, falling of the finger-nails, and loss of hair may occur. Conjunctivitis has also resulted. Dr. J. P. Tuttle records a case in which exposure to the rays caused sloughing of the knee joint for which amputation was required. In some cases a chronic condition of inflammation is produced which finally develops into carcinoma.

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[1] Journal of the American Medical Association.

Dermatitis Ambustionis Bullosa.—The bullous variety of burns and scalds is due to more prolonged contact with one of the above forms of heat, or the latter may be more intense. The pain is severe, the inflammation marked, and great serous exudation occurs, elevating the epidermis, forming blisters and bullæ of all sizes and shapes. The serum presumably contains fibrinogen, since it is capable of becoming solidified. Coagulated serum is in fact, as Mr. Heath points out, sometimes actually seen beneath the intact epithelial layer of the blister. As the result of an increased escape of serum, or from external violence, a few or many of the lesions may rupture, and the epidermis lie in rolls or hang in shreds with the inflamed corium visible beneath. The neighboring glands become swollen and painful. Infection rapidly occurs from pathogenic bacteria on the skin or clothing, or from those carried to it by the air, or the dressings.

Under the most favorable circumstances the serum may be absorbed, the blebs drying into crusts which drop off, exposing a thin epidermis beneath. In other cases, repair takes place by granulation, cicatrices seldom resulting unless the corium is destroyed. Scald of the larynx is not an infrequent accident among the children of the poor whose parents are obliged to leave them alone for many hours, and who, from thirst, are led to drink boiling water from the tea-kettle. Edema of the throat (fauces and epiglottis) occurs within a few hours with dangerous obstruction to respiration.

Dermatitis Ambustionis Escharotica.—The escharotic form of burns and scalds is the result of exposure to an intense or continuous degree of heat occasioning death of the skin, with possibly the deeper parts. The integument in some cases presents a brown, black, or a smooth, white, gray, or yellowish appearance. It may also be hard, dry, or moist, and without the least sensation. In more severe cases, the integument and the subcutaneous muscular fibrous tissues, and even the bones, are completely carbonized and blackened. The skin surrounding the eschar is reddened, swollen, and painful. The depth of the destruction of the tissue can not even be surmised from the appearance of the surface. Pain which may be present at the time of the burn is generally slight, or may disappear, to be soon succeeded by severe or intolerable suffering.

Reactive inflammation follows from about the third to the fifth day, after which the line of demarcation forms, separating the mortified mass from the living part. The eschar is generally cast off in from ten days to two weeks, to be followed by the formation of granulations.

Healing occurs by the formation of fibrous connective tissue, which is destitute of nerves and glands, and which by its overgrowth (keloid) and subsequent contraction, frequently produces hideous cicatrices. This form of burn occurs usually from the direct effect of flame, molten metals, electricity, caustic lime, boiling liquids, steam, or ignited gases.

**Constitutional Symptoms.**—The erythematous variety may be attended with mild fever. The second, or bullous, form is usually accompanied by severe fever and great systemic disturbance. It is exceedingly dangerous in the debilitated, in children, and in old persons, especially if a large portion of the skin is involved. In fact, the involvement of one-third of the cutaneous surface by burns or scalds is invariably fatal, and for one-fourth of the skin to be affected is almost equally dangerous. A patient having such an extensive burn suffers very much from pain and from shock, at the time of the accident, but after the surface has been dressed he may appear to be comparatively comfortable. The urine is often retained, and if an attempt be made to draw it off, not any or but little can be obtained. In severe cases, in the course of from six to thirty-six hours a comatose condition supervenes, the temperature declines several degrees, the pulse becomes small, the respiration rapid, the extremities cold, vomiting may take place, and the coma end in death. Sometimes restlessness and delirium may occur, with clonic spasm and opisthotonos. Hemorrhage has been known to follow at times from the various mucous surfaces. Dr. A. Wagenmann relates[1] a case in which three weeks after the occurrence of extensive burns double hemorrhagic retinitis was observed. This serious consequence is more apt to take place when the burn involves the anterior surface of the body. Death may soon occur in the course of forty-eight hours from shock, or at a later period from erysipelas, pyemia, tetanus, pneumonia, or other complications. In a certain number of cases inflammation, or even ulceration of the duodenum may occur in consequence of a burn. The ulcer may cause perforation and fatal hemorrhage, and may develop within three or four days from the time of the accident, or may not appear for many weeks. Dr. William Hunt, of Philadelphia, reported[2] a fatal case of burns in a woman well-advanced in pregnancy. The child was still-born and had blisters upon the anterior surface of the body corresponding with the lesions upon its mother's body.

**Pathology.**—The red corpuscles of the blood are, in severe burns, changed in form, and their vitality is impaired or even destroyed. They may undergo morphologic changes, even to complete destruction. Escape of the hemoglobin of the erythrocytes into the blood plasma occurs. Small thrombi form which cause necrosis, or ulceration, for instance in the intestine, and causing alteration in the cells of the nervous system, the uriniferous tubules, etc. According to Silbermann's investigations, numerous thrombi, both arterial and venous, result from the altered form of the corpuscles and stasis of the circulation in many organs, particularly the lungs, kidneys, stomach, intestines, spleen, liver, skin, and brain. Thrombi are most numerous in the smaller branches of the pulmonary arteries. This circumstance embarrasses the action of the right ventricle, and gives rise to general venous stasis, with, on the other hand, arterial anemia. The alteration of the circulation explains the hemorrhages and lesions which take place in different organs, as well as the dyspnea, cyanosis, coma, eclampsia, anuria, and lowered temperature of the skin.[1] Silbermann's conclusions are corroborated by Fränkel, who found in the convoluted tubules and loop-tubes of Henle a finely granular and strongly refractive material. The tubules are occluded by degenerated epithelium combined with masses of hemoglobin. Dr. Hunter, in a communication[2] to the Pathological Society of London, January 7, 1890, suggests that the duodenitis may be occasioned by the irritant action produced by the products of destructive tissue change eliminated by the bile. Dr. Emil Welti, of Zürich, attributes the formation of parenchymatous lesions to an accumulation of the blood-plaques described by Bizzozero. Dr. J. Salvioli, of Turin, studying the action of heat upon the exposed mesentery of living animals, found that a deposition of blood-plaques took place upon the walls of the blood-vessels. He furthermore observed an alteration in the vessels themselves, and a certain change in the form of the red blood-corpuscles. According to this investigator, the thrombi and emboli are formed by blood-plaques, which have been detached from the walls to which they had adhered and swept into the circulation. In the belief that cytotoxins must play an important part in the development of these phenomena, von Dietrichs[3] undertook a series of investigations on animals, to determine whether, in connection with burns of the surface, autolysins and autoagglutinins, isolysins and isoagglutinins, and heterolysis and heteroagglutinins are present in the blood, and in what proportion. He reasoned from existing knowledge that specific fixators (intermediary bodies, amboceptors) appear and unite with non-specific cytases (alexins, complements) always present in the blood serum, and form cytotoxins, which, on the one hand, cause agglutination of the red blood corpuscles, with the development of their hemolysins, and, on the other hand, possess cytotoxic and cytolytic properties for various cells of the body. As a result of his observations, he has reached the conclusion that elevation of temperature gives rise especially to complete or partial destruction of the cellular elements of the blood and the tissues. This is followed by the formation and accumulation of cytotoxins (hemotoxins) in the organism, which are injurious not only to the cells of the body itself (autotoxins), but also to the cellular elements of other animals of the same species (isotoxins), although in lesser degree, and also for animals of another species (heterotoxins). The formation of the cytotoxins of the blood takes place probably with especial activity during the first five or ten hours after the inception of the burn, and then gradually diminishes. As endeavors to render the serum inactive by exposure to a temperature of 57° C. for twenty-five minutes yielded a positive result, it can be assumed that the hemotoxins formed as a result of burns also consist of two parts, a specific fixator (amboceptor of Ehrlich) and a non-specific cytase (complement), which is readily destroyed by the action of various agents. In addition to hemolysins, there appear in the blood of animals agglutinins, whose action appears later than that of the bodies already mentioned. To their action are due the emboli and thrombi found after death.

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[1] Medical Bulletin, Aug., 1889, p. 25.

[2] American Journal of the Medical Sciences.

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[1] Centralblatt für med. Wissenschaft, 28, 1889.

[2] Lancet, January 11, 1890, p. 81.

[3] Wiener Medizinische Wochenschrift, Nov. 21, 1903, p. 2206.

The changes in the blood after burns are fully explained by the formation of hemolysins and hemoagglutinins. The presence of other cellular poisons may be suspected in the organisms of burned animals, whose specific effects on cellular elements of a definite kind can be compared with the action of the hemolysins and hemoagglutinins on the elements of the blood.

**Treatment.**—In the most severe form of burns the constitutional symptoms demand immediate attention; the depression, shock, and pain should be relieved by a full dose of opium (a hypodermic of gr. 1/4 or 1/2 of morphine being preferable); a hot, stimulating drink of ginger-tea, or whiskey or brandy, is also valuable. After the patient has been made locally comfortable, the opiate and stimulants should be continued, together with full doses of quinine and be frequently fed with plenty of nutritious broth.

The preparations of ammonia, especially the aromatic spirit and the carbonate, in full doses, frequently repeated, will be serviceable, especially if there is profound depression or shock. Locally the pain of the erythematous variety can be immediately relieved by applications of cold water, lead-water, and laudanum, a solution of cocaine, or a three-per-cent. solution of creosote or phenol, or a saturated solution of bicarbonate of sodium. A combination of camphor, 20 parts; phenol, 30 parts; liquid petrolatum, 50 parts, is useful for small burns. The carbonates of lead and zinc, the nitrate of lead, and the subnitrate of bismuth are also beneficial, and may be used either as a dusting-powder or ointment. In the State Hospital at Fountain Springs, Pa., Dr. J. C. Biddle uses a mixture consisting of carbonate of lead, 1 pound; powdered acacia, 6 ounces; bicarbonate of soda, 3 drams, and a sufficient quantity of linseed oil to make a thick creamy paste. This is spread on lint, or Canton flannel, then cut into strips and applied to the burnt surface. After all the blisters have been cut open, the shreds of cuticle are removed and the burned area is washed with soap and water. He does not advise frequent dressing, except when suppuration occurs. The treatment is continued until the surface is covered by granulations, when a petrolatum dressing or powdered stearate of zinc is applied.[1]

No matter how severe the burn, Swaving washes the burnt area with a warm solution of boric acid, salt or sterile water, preferably the latter. Large vesicles are incised and then a picric acid dressing is applied. After all sloughing has ceased he applies an ointment consisting of equal parts of zinc ointment, bismuth formic ointment and petrolatum.

Estes uses a warm sterile alkaline solution for the first dressing, or a 2-per-cent. solution of phenol, or a 1-per-cent. suspension of creolin followed by physiologic salt solution. He advises dressing large burns in sections rather than to expose the entire burned surface at one time. When a slough is present he has found the application of salicylic acid directly on the slough, gutta-percha tissue over this, and a dry, sterile dressing over all, very satisfactory, both as an efficient disinfectant and as a deodorant. When grafting must be resorted to he uses small bits of a thoroughly cleansed and bleached moist sterile sea sponge, applied in the same manner as a skin graft. Some employ a solution of nitrate of silver, ten grains (0.60 gm.) to the ounce (32 gm.), painted upon the affected surface. This certainly protects the area from the air, but is open to the objection that it blackens the skin and is not attended by any compensating advantage. Mr. Christopher Heath preferred a mixture of one part of collodion to two of castor-oil for face burns. Both flexible collodion and solution of gutta-percha are beneficial by exercising gentle compression and excluding air. Relief is also given by the application of the fluid extract of Jamaica dogwood. Plantain leaves made into a paste by bruising in a mortar are said to be an efficient remedy.

In the bullous variety, the healing process may be hastened by pricking the blebs, permitting their contents to run out, but retaining their covering as a protection to the corium beneath. Any of the lotions, ointments, or powders above suggested may then be applied to the affected surface. At the Friedrichshain Hospital, of Berlin, Bardeleben gives the preference to finely powdered subnitrate of bismuth, which is freely dusted upon the surface after the bullæ have been opened and the part thoroughly washed with two-and-a-half- or three-per-cent. phenolized water or a solution of salicylic acid three parts in 1,000. Thymol iodide is an excellent dressing to erythematous or bullous burns. It may be applied in the powder form or made into an ointment. Lanolin with ointment of rose-water may very effectively be used as an excipient, and cocaine incorporated for its anesthetic effects. The ointment of aluminium oleate may be mentioned as a good dressing. Zinc, lead, or borax ointment with arrow-root suffices in some cases; in others, olive oil, alone or with a small quantity of mercury or phenol, may be more acceptable. Equal parts of linseed oil and lime-water form an old and valuable application, known as carron oil, from the iron works in Scotland, where it was first used. Sterilized olive oil may be substituted for the linseed oil making a cleaner dressing. An ointment containing europhen is beneficial. Tannic acid is said to relieve pain and promote healing. The epidermis having been removed, a five-per-cent. solution is expressed from a sponge and the part dressed with some ointment either with or without tannin. Capullano uses a solution in glycerin (50 per cent. or less). After puncturing any bullæ he applies this pasty liquid on gauze covered with absorbent cotton. The application is to be repeated several times daily, without removing the gauze. The tannin is antiseptic and coagulates the albumin, thus forming a protective varnish over the tissues. According to Grigoresen the application to the affected surface of pure glycerin, though it may at first cause smarting, soon gives rise to local anesthesia and allays inflammation. Dr. Zubofl recommends compresses moistened in a solution of permanganate of potassium. Other substances beneficial in the erythematous and bullous varieties are grindelia, a drachm (4 gm.) of the fluid extract to four or six ounces (128 or 192 gm.) of water; hamamelis ointment, fifteen or twenty grains (1 or 1.30 gm.) to the ounce (32 gm.); and a wash containing fluid extract of phytolacca. A strong solution of Epsom salts is said to relieve rapidly the pain, heat, and swelling. Picric acid has the same effect, used in strong solution; the stains which it leaves may be removed by washing with boric acid or a saturated solution of lithium carbonate. For burns of moderate severity Lathrop favors picric acid. For deep burns he uses picric acid, for five or six days, followed by vaselin on lint, with iodoform or acetanilid. Urmson also favors a picric acid dressing in burns of the first and second degree. In burns of the third degree picric acid is applied for 24 hours, and then some sterile powder, usually aristol. When there is deep sloughing, he employs an immersion bath of a 1 to 12,000 solution of bichloride of mercury at body temperature. Potassium nitrate is recommended by Poggi in burns of all degrees. Vergely has successfully used in erythematous and bullous burns, calcined magnesia, made into a paste with water; Bilder reports favorable results from the use of a mixture of equal parts of thiol and water.

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[1] Therapeutic Gazette, June, 1907.

In the escharotic variety the clothing should be removed and the patient placed upon some soft fabric. Detached or charred fragments should be snipped off, and any of the remedies previously mentioned gently applied. If there is much shock no attempt should be made to remove the necrotic tissues. The surface may be cleansed with a weak phenol solution or simply normal salt solution. Plain sterilized petrolatum may be then applied for a few days or until granulation becomes active; when the surface may be covered with rubber tissue cut to fit the lesions without overlapping. Over this gauze and absorbent cotton are applied. This form of dressing is advocated by Johnson,[1] (See Wood's Reference Handbook) and many others. Its chief advantage is that it is painless. If the part involved is extensive, oil alone or combined with a powder dusted over the surface may be used to create a protective coating. Phenolized or salicylated cotton, lint, gauze, or borax lint will also be useful. The dressing should not be changed too frequently. Sutcliffe,[2] surgeon of the British navy, believes we have in lotions, the most rational form of dressing for cases of burns and scalds. He prefers lotions of perchloride of mercury, boric and picric acids. R. Petit[3] announces that healing was much more rapid in the burns treated with the hot horse serum than in other burned patches on the same child treated with picric or boric acids, etc. He believes that the horse serum revives the injured cells, possibly including the nerve cells, so that they recuperate and aid in the healing process, instead of dying and generating poisons. The serum also summons the leucocytes to the spot, while its harmlessness has been demonstrated. The condition of the surface should be carefully watched, the dressing renewed once in twenty-four to forty-eight hours, or even oftener, should the discharges become copious and troublesome.

The continuous water-bath, as employed by Hebra, is resorted to occasionally with benefit. In bullous or escharotic burns, the application of iodoform according to the method of Von Mosetig-Moorhof has proved very efficacious, especially in the relief of pain. The bullæ are opened, the surface cleansed with a very weak solution of common salt, several layers of iodoform-gauze are placed upon the burn, and the whole covered with a layer of oil-skin. This dressing is not changed for one or even perhaps two weeks. After the eschars have separated, resorcin in a one- or two-per-cent. solution is preferred by M. Hebra to iodoform. Some patients show an intolerance of iodoform and when freely used, it may cause death. Dr. J. G. Carpenter reports two cases in which ice-water was successfully used. Soft linen cloths saturated in ice-water were kept constantly applied to the surface, renewed every ten or fifteen minutes for twelve hours, then every hour or two for twenty-four hours, and every two or three hours for a further period of twelve hours. The patients suffered from no pain, and in forty-eight hours the burns were virtually cured. Sozoiodol is recommended as a substitute for iodoform. The former allays pain, prevents suppuration, is free from odor, and does not cause systemic poisoning. After the vesicles have been punctured and their contents have escaped, a mixture of sozoiodol (ten-per-cent.) and starch is dusted upon the surface and a bandage applied. Ulcerated surfaces or exuberant granulations may be overcome by stimulating ointments, the application of solid nitrate of silver or sulphate of copper, or by skin-grafting. J. E. Cannaday, of Hansford, W. Va.,[1] cleanses the burned area with physiologic saline solution, and then applies sterilized petrolatum and a light gauze dressing. If pus appears it is removed by irrigation, and the part affected is touched with a weak solution of iodin. In the operation of skin grafting, a modified Thiersch method is usually employed. Certain cases of superficial burns are treated according to Sneve's method, which consists in exposing the burned surface to the air without any covering. This stimulates granulation, but is usually very painful. Ritter[2] confirms the prompt relief of pain and the promotion of healing by application of Bier's constriction hyperemia in treatment of local burns. The constriction hyperemia relieves the pain in a local burn, as also in case of a frozen member and the most painful form of gangrene.

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[1] Northwest Medicine, Seattle, June, 1907.

[2] British Medical Journal, August 3, 1907.

[3] La Presse Médicale, June 13, 1908.

Thiersch's method of grafting is particularly appropriate to the treatment of large ulcers caused by burns. The resulting scars exhibit much less than the usual tendency to contraction. An excellent and often effective remedy is powdered red cinchona bark. Old obstinate ulcers may be induced to take on healthy action by the application of the infusion of jequirity. Healing may be stimulated by dressing with resin cerate for a few days. Scars, which frequently remain, may be removed by massage, galvanism, the application of collodion, or by surgical procedures. In edema of the larynx from a burn or scald the inhalation of ether, ethyl iodide, nitrite of amyl, or chloroform with creasote, may be of service. A spray of cocaine and adrenalin will be of advantage. Scarification of the part may also be practiced, and, if relief will not follow this procedure, resort may be had to laryngotomy.

## CONGELATIO.

SYNONYMS.—Dermatitis congelationis—Frost-bite.

A Frost-bite is a dermatitis, or an inflammation of the skin and an affection of the sensory nerves (paresthesia) resulting from the action of cold. The deeper tissues may also become devitalized and gangrene followed by sloughing may result. Death may occur from shock, or hemolysis may occur as in burns.

**Symptoms.**—Healthy persons with a vigorous circulation, must usually be subjected to long and excessive exposure to cold before inflammation of the skin supervenes. Anemic and debilitated cases, however, frequently suffer from frost-bite at a temperature at which healthy individuals are not in the least affected. Frost-bites may disappear with return of health, but more frequently the passive hyperemia or inflammation lingers long after the exciting cause has been removed, disappearing with the advent of spring and summer, to return in fall and winter, or upon the slightest change in the atmosphere. The chief local symptoms of frost-bites are redness, heat, itching, an intolerable smarting or burning sensation in mild cases, and high inflammatory action and often absolute loss of sensation in the affected part in severe cases. They may be divided, as in the case of burns, into three classes, or degrees, as follows: Dermatitis congelationis erythematosa, dermatitis congelationis bullosa, and dermatitis congelationis escharotica.

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[1] Therapeutic Gazette, June, 1907.

[2] "Constriction Hyperemia Treatment of Burns;" Anwendung der Stauung bei Verbrennungen; Ritter.

Dermatitis Congelationis Erythematosa.—This is also known as Pernio, or chilblain. The lesions are brownish-red swellings of the skin especially on the hands and feet. They are caused by the cold which produces stasis and paralysis of small vessels, with some serous exudation between the layers of the cutis. They occur principally in children. Frost-bites of this form generally occur on the most exposed parts, as the hands, feet, ears, cheeks, and nose. Previous to their development the affected skin, owing to the contraction of the blood-vessels, is pale and wanting in sensation; but on the cold abating, or the patient passing into a warm atmosphere, the small vessels dilate, the part becomes livid, and pains, burns, smarts, or itches. The local symptoms, therefore, are not much noticed during the day unless the person is in a heated room, but are decidedly annoying in the winter evenings when near the fire or after retiring. The skin may not only be reddened, but it may be exceedingly thin, shining, and swollen from serous infiltration. Blisters may develop from friction or scratching, and finally degenerate into one or more indolent ulcers. A case has been recorded by Taenzer, in which an individual had suffered for twenty years from "chilblain of the lip." The affection, which recurred every winter and disappeared in the spring, was attended by fissures, desquamation, and pruritus.

Dermatitis Congelationis Bullosa.—This more severe grade of the preceding disease is the effect of prolonged subjection to moderate cold, or comparatively brief exposure to excessive cold. The inflammation is more intense, leading at once to great serous exudation, with the formation of blebs of varying sizes filled with a clear or bloody fluid. Ulceration of the affected parts may follow and extend even to the bone. The pain and itching are violent, and great edema of the surface is present.

Dermatitis Congelationis Escharotica.—This is the most severe form of frost-bite and is observed especially among drunkards and those who have been exposed for a long time to the action of moist and intense cold. It may be rapidly produced by application of liquid air, or by ether-spray. The skin is usually the seat of large blisters, containing blood, with perhaps mortification of the tissue beneath. If no blisters have formed, the part involved is livid or white in color, cold and insensible, the circulation being suspended or absolutely destroyed. If the vitality of the part be only interrupted, upon its restoration all the symptoms of severe inflammation follow, or, as is more common, gangrene results, and the usual line of demarcation occurs.

Pyemia or septicemia may develop in this form of frost-bite and result in death.

**Constitutional Symptoms.**—The systemic effect of excessive or long-continued cold is first stimulation, to be followed by a dull and heavy sensation, with an intense desire to sleep, which if yielded to will pass into coma and death.

**Treatment.**—Constitutional remedies are of the greatest value. If anemia exist, tincture of the chloride of iron or other ferruginous preparations are of the utmost service. Predisposed (anemic or neurasthenic) patients should receive a nutritious diet, be warmly clothed with flannels, woolen gloves, and stockings, and avoid undue exposure to cold. Socks or stockings should be changed as soon as they have become damp, and should be washed, or, at least, thoroughly dried before they are again worn. Strumous children are particularly susceptible to the influence of cold, and it is therefore advisable to strengthen their systems by the frequent use of codliver oil, malt and syrup of the iodide of iron. Brocq speaks favorably of the administration throughout the winter months of pills containing sulphate of quinine, ergot, digitalis, and belladonna, the remedies being from time to time suspended. Those who have great systemic depression or suspended animation from excessive or long-continued exposure to cold should be treated as follows: The use at once of hot applications all over the body, or the warm bath (at 98° to 100° F.); covering them with hot blankets; hot drinks, if they can be taken; moderate massage or friction; and prolonged artificial respiration, if life has been apparently destroyed.

LOCAL TREATMENT.—Some believe that the frost-bitten surface should be vigorously rubbed with snow or cold water, in order to avoid producing reaction too rapidly; others claim that hot applications used at once to the skin are the most efficacious. The experiments of Laptchinkski upon frozen dogs show that, "of twenty animals treated by the method of gradual resuscitation in a cold room, fourteen perished; of twenty placed at once in a warm apartment, eight died; while of twenty immediately put into a hot bath all recovered." Applications of hot water to the affected area will be accepted in most cases, especially if the part has been frozen. Occasionally cold applications act better. Electric foot-baths are recommended by Dr. H. Lewis Jones, a current from an induction coil, as strong as can be borne without discomfort, being passed through the water. The drugs and combinations recommended are numerous, but few are effective. All remedies are more decided in their action when the circulation of the part is not interfered with by the use of tight apparel and close-fitting boots or shoes. The tincture of myrrh and compound tincture of benzoin, in equal parts, form, for ordinary cases, an excellent application. An ounce and a half (48 gm.) of compound tincture of benzoin with half an ounce (16 gm.) of spirit of chloroform is also valuable. Cocaine hydrochloride, one to ten grains (0.06 to 0.06 gm.) to the ounce (32 gm.) of peppermint-water or dilute nitric acid, may be painted over the surface with good results. The tincture of aconite often gives relief. The following are useful applications:

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|---|---|---|---|---|
| ℞ | Olei camphoræ .................. | ♏ x. | 0.60 | |
| | Bals. Peruv. .................. | fʒj. | 4. | |
| | Sevi .......................... | ℥j. | 32. | M. |
| ℞ | Adipis lanæ hydrosi ............. | ℥ss. | 16. | |
| | Betanaphthol .................. | gr. xv. | 1. | |
| | Olei terebinthinæ rectificat. ....... | fʒss. | 2. | M. |
| ℞ | Adipis lanæ hydrosi ............. | ℥ss. | 16. | |
| | Phenolis hydrat. ................ | gr. iij. | 0.18 | |
| | Pulv. camphoræ ................ | ʒss. | 2. | M. |

Balsam of copaiba, collodion, tincture of iodine, and weak solutions of corrosive sublimate alone or combined with other remedies are valuable. Mercurial ointment, or creosote ointment, petroleum, and turpentine have been used with more or less advantage. The oil of cajuput diluted with olive oil; the tincture of capsicum, alone or mixed with equal parts of mucilage of gum arabic; and a tincture of rhus toxicodendron (one to two of alcohol) half a drachm (2 gm.) in a pint (512 gm.) of water, have been recommended. Professor Boeck, of Christiana, suggests resorcin when the skin is unbroken. Dr. Achilles Rose, of New York, states that nothing gives more prompt and complete relief than strapping with zinc oxide rubber adhesive plaster. When ulceration supervenes, the following combinations will be of benefit:

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|---|---|---|---|---|
| ℞ | Bals. Peruviani ................. | fʒj. | 4. | |
| | Ungt. hydrarg. nitratis .......... | ʒij. | 8. | |
| | Zinci carbonatis ................ | ʒj. | 4. | |
| | Ungt. aquæ rosæ ................ | ℥j. | 32. | M. |
| ℞ | Ungt. plumbi subacetatis ......... | ℥ss. | 16. | |
| | Ext. arnicæ ..................... | ʒss. | 2. | |
| | Ext. cocæ ...................... | ʒss. | 2. | |
| | Ol. anthemidis .................. | ♏ v. | 0.30 | |
| | Ungt. aquæ rosæ ................ | ℥ss. | 16. | M. |

Besnier and Brocq recommend the part to be bathed in a decoction of walnut leaves, dried, rubbed with camphorated alcohol, and covered with a powder consisting of one part of salicylate of bismuth to nine parts of starch. To alleviate itching, they rub the surface with equal parts of glycerin and rose-water containing half a grain (0.03 gm.) of tannin to the ounce (32 gm.); the powder is then reapplied. As a dressing to ulcers they employ walnut leaves soaked in warm water. The official ointment of phenol (3 per cent.) is a good application for chilblains, especially for children, as it relieves itching promptly. Alum, borax, weak solutions of nitrate of silver, oil of turpentine, and cantharides have been used with advantage. The ointment of aluminium oleate, nut-gall, or tannic acid, sulphurous acid, one or two drachms (4 or 8 gm.) to the ounce (32 gm.) of water, or glycerin and water, or an ointment containing storax, are applications which may be serviceable. If gangrene occurs, the sloughs should be cut away as soon as the line of demarcation is formed, and the healthy granulating surface dressed with a mild stimulating ointment.

## ERYTHEMA MULTIFORME.

SYNONYMS OR VARIETIES: Erythema annulare—Erythema iris—Erythema marginatum—Erythema papulosum—Erythema tuberculosum.

Erythema multiforme is an acute inflammatory cutaneous affection, characterized by reddish or varicolored macules, papules, or tubercles, differing in size and shape.

**Symptoms.**—Erythema multiforme is preceded or accompanied by headache, gastric disturbance, and pain in the joints. The intensity of the pain is variable, sometimes being very slight and again equalling in severity that of acute rheumatism. Occasionally inflammation of the throat is experienced a few days before the appearance of the eruption. In some cases a slight rise in temperature is observed. The eruption is varied in character, and consists of either macules, papules, or tubercles. The name of the affection—erythema multiforme—is significant of the protean character of its lesions. The eruption usually commences, however, as small roseolous spots or macules, which rapidly increase in size, forming large, erythematous patches. The peculiarities of form which these patches assume have led to the employment of the terms annulare, iris, and marginatum, as indicative of their shape and appearance. When the erythematous area increases by peripheral extension, but fades in the centre, it is termed erythema annulare. When a new patch is developed within an existing ring and rapidly undergoes the same process of peripheral extension and central resolution, a series of concentric rings is formed, exhibiting a variety of colors; this is the condition known as erythema iris. When two or more circles meet, to form serpentine bands, the eruption is termed erythema gyratum. When an erythematous patch attains a considerable size, and presents a sharply defined border, which is slightly raised above the adjacent normal surface, it is known as erythema marginatum, In some cases the eruption commences as small papules, which vary in size from a pin's head to a split pea. They are round or oval in shape, and bright red or violaceous in color. They are firm to the touch, and are slightly elevated above the surrounding surface. They pursue a variable course but usually disappear spontaneously in five or six days. This form of the disease is known as erythema papulosum. When the papules increase to the dimensions of a small bean or larger, the affection is termed erythema tuberculosum. In some cases the eruption is complicated by the development of vesicles and bullæ.

The eruption is usually symmetrical in character. It may appear upon any portion of the body, but is met with most frequently upon the dorsal surfaces of the extremities. The mucous membrane is occasionally affected. The lesions pursue an acute course, usually disappearing by resolution in three or four days, leaving more or less pigmentation of the surface. The disease may be protracted for a week or more by the appearance of a second or third crop. The accompanying subjective symptoms are usually slight.

**Diagnosis.**—The only diseases resembling erythema multiforme are papular eczema, urticaria, and erythema nodosum. The papules of erythema multiforme are large, irregular in shape, and are not attended by much itching or burning. Those of *eczema* are small, and are accompanied by intense itching and burning. The lesions of *urticaria* are ephemeral in character, appearing and disappearing in a few minutes; those of erythema multiforme remain for days. The color and subjective symptoms are also different. In *erythema nodosum* the eruption consists of large, firm nodes, and not of slightly elevated patches or papules.

**Pathology.**—The pathological processes concerned in the production of the lesions of this disease are dilatation of the capillaries of the corium, and exudation of serum into the surrounding tissue. In some cases hemorrhagic extravasation takes place. There is slight scaling of the superficial cells of the epidermis.

**Etiology.**—The etiology of erythema multiforme is still unsettled. It may occur in either sex and at any period of life. This affection in babes frequently occurs upon the nates as a result of irritating diarrheal discharges. It is said to appear more frequently during the spring and autumn, but it may happen at any period of the year. In some cases it appears to be dependent upon the rheumatic or lithemic diathesis, in others it is evidently due to disturbances of digestion. Malarial influences are also potent factors in its production. Almost all of the infectious diseases may be accompanied by an eruption of erythema multiforme, notably syphilis, tuberculosis, cholera, typhoid fever and septicemia.

Erythema occasionally appears during pregnancy or after delivery, sometimes after operations upon the uterus, and in connection with irritation of the urethra or bladder. Polotebnoff has observed a papular erythema in a case of icterus, and one of papulo-tubercular erythema in cirrhosis of the liver. He states that in some years ninety per cent. of the cases of erythema which he has met with have been associated with acute catarrh of the stomach. Osler cites a number of cases in which erythema multiforme was concurrent with nephritis, hemorrhage from various mucous membranes, bronchitis, or arthritis. De Molènes has seen erythema in gonorrhea, and suspects that the rash attributed to cubebs or copaiba may not infrequently be due to the urethritis, since he has often found that upon increasing the dose the rash disappeared. Lewin suggests that it may at times be reflex in character, from genito-urinary disorders. M. Dujardin reports a case in which an attack of infectious conjunctivitis was followed by erythema multiforme. This affection also occasionally develops in consequence of emotional paroxysms. Luzzato has found isolated and grouped cocci in the blood of a patient with erythema multiforme.

**Treatment.**—The treatment must be symptomatic and somewhat empirical in character. If there is any reason to suspect malarial poisoning, quinine should be administered in full doses. If the patient is of the lithemic diathesis, colchicum, lithium, and the alkalies are indicated. If there is rheumatic taint in the constitution, more benefit will be obtained from the administration of the salicylates. They are also of service in relieving the articular pains that may be present. When evidences of gastric disturbance exist, the diet should be regulated and the digestion assisted by large doses of pepsin, either alone or in combination with nux vomica and hydrochloric acid. Iron, especially to anemic or debilitated patients, may frequently be given with advantage. The functions of the bowels should be carefully regulated in all cases. Local applications are useless, unless there are marked itching and burning, and when such is the case, weak lotions of phenol or creosote will be found effective. Ointments may be used instead of lotions if advisable. A warm bath containing bicarbonate of sodium is often used in relieving the subjective symptoms.

**Prognosis.**—The prognosis is always favorable. The eruption invariably runs a benign course, and terminates in recovery in from one to three weeks, but relapses may take place from time to time.

## ERYTHEMA NODOSUM.

SYNONYM.—Dermatitis contusiformis.

Erythema nodosum is an acute inflammatory cutaneous affection, characterized by a number of reddish or purplish nodules of different shapes and sizes.

**Symptoms.**—The development of the eruption is usually preceded by slight fever, general *malaise*, gastric disturbance, and pain around the joints. In some cases sore throat occurs. In others these premonitory symptoms are not observed. The eruption consists of a varying number of nodules, which are seated in the corium and subcutaneous connective tissue. They range in size from a bean to a large walnut. They are round or oval in shape, and firm and slightly painful to the touch. Their color changes from a light red at first to purple later. Erythema nodosum may be developed upon any portion of the surface, but occurs most frequently upon the lower extremities, especially over the anterior surface of the tibiæ. The nodules are also often observed upon the ulnar surface of the forearms. They are frequently developed in crops, which may appear in succession upon various regions of the surface. As a rule they are accompanied by more or less itching and burning sensations. In some cases their growth is attended by marked febrile excitement. The nodules number from one to thirty, or more, and reach their maximum in about three days. They then remain without change for a period after which they become soft and painless and gradually disappear by absorption. During this stage they present a brown, green, and yellow appearance, in accordance with the changes produced in the hemoglobin of the effused blood while undergoing absorption. The first nodules usually disappear in from ten to fifteen days after their development, but, as they may be followed by a succession of others, the disease rarely terminates for two or three weeks, and in some cases it is prolonged for months. Nodules may form on the tongue or on the mucous membrane of the mouth and pharynx, producing so much pain and difficulty of deglutition as seriously to interfere with nutrition.

The eruption may be complicated by the simultaneous development of vesicles or bullæ, or by an inflammation of the adjacent lymphatic vessels. Suppuration never occurs, but usually a slight pigmented spot remains at the side of each node for an indefinite period. Polotebnoff, however, speaks of seeing suppuration take place in one case of erythema nodosum. A case has also been recorded by Hoisholt[1] in which papules and tubercles having every characteristic of erythema nodosum became infected, terminated in pustules; and, in one situation, the coalescence of a number of these caused an abscess.

**Diagnosis.**—The diagnosis of erythema nodosum is comparatively easy. The only affections which present any similarity to it are urticaria nodosum, the gummatous syphilide, and ordinary contusions of the surface. In *urticaria nodosum*, however, the cutaneous lesions are ephemeral in character, appearing and disappearing in a few minutes or hours, and are not followed by pigmentation. In erythema nodosum the lesions remain for days, and are always followed by pigmentation. The subjective symptoms are also different.

*Syphilitic nodules*, or *gummata*, are soft, painless to the touch, single or few in number, slow in development, and frequently terminate in ulceration. The lesions of erythema nodosum are firm, painful to the touch, rapid in development, usually multiple, and rarely end in ulceration. The gumma is generally accompanied by other evidences of syphilis. Ordinary *contusions* may resemble the lesions of erythema nodosum when first seen, but their number, location, history, and course will prevent any error of diagnosis from being made.

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[1] Monatshefte für prakt. Dermatologie, Bd. ii, No. 5.

**Pathology.**—The pathological changes in erythema nodosum consist of dilatation of the blood-vessels of the corium and subcutaneous connective tissue, and an enormous exudation of serum and blood into the interstices of the corium and the rete mucosum. The lymph-vessels are also swollen, and migration of numerous lymph-cells occurs.

**Etiology.**—The cause is not known. It is met with in adults and children, females and males, in apparently robust as well as debilitated subjects. It has been considered by Bohn and others analogous in origin to purpura rheumatica, while Lewin considers it an angio-neurosis. In several cases which have come under my observation, lithemic diathesis was the apparent cause. Quite a large proportion of cases occur in rheumatic subjects. Garrod states that this association is occasionally direct; that chorea or old heart-lesions point, in some cases, to a rheumatic origin, and that in others, though no articular pains are present, the patients have formerly suffered from rheumatism. He concludes that both erythema multiforme and nodosum are often, perhaps usually, manifestations of the rheumatic process, though we are not justified in concluding that this is always their origin. Dr. Stephen Mackenzie has made a study of 108 cases of erythema nodosum. He coincides with the opinion of Garrod, and writes that "these conclusions justify the inference that erythema nodosum is frequently, if not generally, an expression of rheumatism, even when no definitely rheumatic symptoms are present." J. O. Symes[1] says it is difficult to recognize any rheumatic taint, in a large proportion of cases. Even when arthritis is present, it may differ very remarkably from that found in acute rheumatic fever. His experience is that chorea, endocarditis or arthritis are not found in more than 10 per cent. of all cases of erythema nodosum. Moreover, the arthritis of this disease and the accompanying pyrexia are little influenced by the administration of salicylates. The arthritis may be painless. In other cases the arthritis is evidently rheumatic and yields to ordinary remedies. Baumler, of Freiburg, considers erythema multiforme and nodosum to be different forms of one disease, which is of infectious origin. Taylor has seen it accompany chronic bronchitis and acute pneumonia. Dr. Hermann Schulthess states that damp dwellings seem to play an important part in its causation, and that a rapid bodily growth possibly constitutes a predisposing cause in children. An occurrence related by Launois might raise the question of a possible contagious element in erythema nodosum. Three cases developed in patients occupying the same row of hospital beds within eight days after admission of a case of the cutaneous disorder. A case has been reported by Dr. Titomanlio of a woman who had suffered within two years from eleven attacks of erythema nodosum. During the first an acute glaucoma of the left eye developed, and in the sixth attack the right eye was affected in the same manner but less severely. Erythema nodosum occasionally follows typhoid fever.

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[1] Brit. Med. Jour., July 27, 1907.

**Treatment.**—The patient should be kept in bed until the febrile symptoms subside, after which he is to be encouraged to take moderate exercise in the open air every day. The diet should consist principally of milk, bread, fruit, and vegetables. The medicinal treatment must be varied in accordance with the requirements of each individual case. In stout or robust subjects, good results may be obtained from the administration of lithium, colchicum, and the alkalies. The iodide of potassium or sodium is particularly serviceable in some cases, according to Brocq. The joint-pains are usually ameliorated by the salicylate of sodium. In the anemic and debilitated, more benefit will be derived from the employment of quinine and iron. The tincture of the chloride of iron is especially valuable, in doses of twenty or thirty minims after meals. Saline laxatives are indicated in all cases in which constipation exists. If the digestion is weak, it should be assisted by pepsin and hydrochloric acid. The pain and itching may be relieved by soothing ointments or lotions, as in the following formulæ:

| | | | |
|---|---|---|---|
| ℞ | Veratrinæ | gr. v. | 0.30 |
| | Bismuthi subnitratis | ʒij. | 8. |
| | Adipis benzoinat. | ℥j. | 32. |

M. Ft. ungt. Sig.: Apply externally.

| | | | |
|---|---|---|---|
| ℞ | Tinct. aconiti | fʒss. | 2. |
| | Phenolis liquefact. | gr. x. | 0.60 |
| | Spts. vini rect. | fʒij. | 8. |
| | Aquæ menth. pip. | f℥iv. | 128. |

M. Ft. lotio. Sig.: Use externally.

A lotion of hamamelis and arnica is recommended by Piffard. Cold applications or evaporating lotions relieve pain in some cases, while in others warm fluids prove more efficacious. In the later stage of the affection gentle pressure by means of the roller bandage is of service, and the same may be said of the local use of flexible collodion.

**Prognosis.**—The prognosis in uncomplicated cases is always favorable. Recovery ensues as a rule without treatment in two or three months, and with treatment in a much shorter period. Relapses not infrequently take place.

Erythema Induratum.—Deep-seated nodules appearing under the skin to which they ultimately become attached; chronic in their course, attaining the size of a cherry, or a little larger, especially in young women, and around the ankle, or on each side of the tendo Achillis, are the characteristic clinical features of this variety. The skin subsequently becomes purplish over the lesion and finally ulcerates with a scanty seropurulent discharge. Similar lesions have been produced by injections of tuberculin. They also frequently occur in phthisical subjects. Although tubercle bacilli may not be discoverable in these lesions, they are apparently of tubercular origin, and closely resemble the ulcerating scrofuloderma.

L. Weiss, of New York, says that the localization of the lesions on the legs may be regarded as the classical feature of erythema induratum. Sluggish circulation, impaired *vis a tergo*, are the main causes of its appearance there and also of lupus pernio or simple pernio so frequently accompanying this trouble. While the disease almost exclusively affects females, yet in rare instances it has also been found in men, and, although it is most frequently met in adolescent girls and young women, yet of late it has been found in older women also. Johnston found it in association of what is called to-day papulo-necrotic tubercle on the hands and forearms. He calls these affections paratuberculoses.

## URTICARIA.

Synonyms.—Febris urticata—Urticaire—Nesselausschlag—Hives—Nettle-rash.

Urticaria is a mild inflammatory affection of the skin, characterized by the sudden development of a number of wheals, which are ephemeral in character, and are accompanied by marked stinging, pricking, itching, or burning sensations.

**Symptoms.**—Urticaria may appear at any period of life, but it is most frequently observed during childhood. Its advent is usually preceded by general lassitude, slight headache, epigastric oppression, and other symptoms of gastro-intestinal disturbances. The tongue is usually furred, and the temperature elevated from half to one or two degrees above the normal. Exceptionally very severe symptoms, as high fever, cerebral congestion, and delirium, precede the eruption. In many cases no evidence of constitutional disturbance can be observed until after the development of the characteristic eruption. This appears abruptly, and not infrequently reaches its maximum development in a few minutes. It consists of wheals, in size from a split pea to a silver dollar, or larger, are firm to the touch, and slightly elevated. They number from four or five to a hundred or more, are generally round or oval, but may assume irregular forms. They vary in color from white to pink, or bright-red, but generally present a white elevated spot in the centre, and are surrounded by a more or less distinct areola, are usually isolated, but may coalesce and form large irregular patches. They may be developed upon any portion of the skin, but are most frequently met with upon the chest, abdomen, and extremities. They have also been found upon the mucous membranes.

Kaposi mentions its occurrence in the mouth, pharynx, and upon the epiglottis, in which situations it is apt to occasion symptoms of asphyxia. Bock has reported a case of urticaria of the tongue, which swelled suddenly and filled the mouth, the organ was of a bluish color, bright and glistening, hard and elastic. The diagnosis of lingual urticaria reposed upon the rapid development of the edema, absence of traumatism, the peculiar appearance of the tongue, and the knowledge that the patient frequently suffered from attacks of urticaria.[1] Similar cases have been described by Laveran, Sevestre, and others. In some instances urticaria has been accompanied by nausea and hematemesis, leading to the inference that the gastric mucous membrane might be the seat of lesions similar to those of the skin. The coexistence of wheals upon the skin and asthma suggests that the disease may involve the bronchial tubes. Urticaria is accompanied by burning, pricking, or stinging sensations similar to those which are occasioned by contact with the stinging nettle. These differ in severity; in some producing only trifling annoyance, and in others entailing intense distress. The desire to scratch becomes irresistible in severe cases, and the patient often tears his flesh to obtain relief. The relief, however, is only temporary, and the irritation caused by scratching invariably produces an increase in the number and size of the wheals. The eruption is extremely ephemeral in character. In some it attacks several regions of the body in succession, but only remaining for a brief period in each location. Urticaria is ordinarily an acute affection, and rarely lasts longer than a few hours or a day or two, during which several outbreaks of the eruption occur. It may continue, however, as a chronic affection. The duration of urticaria depends entirely upon the discovery and the removal of its exciting cause.

ACUTE URTICARIA.—An attack of acute urticaria is usually preceded or accompanied by a feeling of languor and general depression. The tongue is coated, the pulse is quickened, the temperature is slightly elevated, and there are sensations of nausea and epigastric oppression. The urine is usually high-colored and strongly acid. The eruption appears abruptly and spreads rapidly, sometimes covering the whole body in an hour or two. Generally, however, it is limited to one or more regions of the surface. The individual wheals are extremely evanescent, disappearing and reappearing several times during the attack. Friction and pressure always hasten their reappearance and increase their number. When they occur on the face they appear, as a rule, on the forehead, eyelids, cheeks, nose and ears, producing more or less swelling and disfigurement. They generally remain isolated, however, and, unlike those which are developed on the trunk and extremities, do not coalesce and form large, solid, irregular masses. The eruption of acute urticaria is invariably the seat of intense burning, pricking, or stinging sensations, which sometimes become almost unendurable. Finally, after the lapse of a few hours, or a day or two, the symptoms gradually subside, the itching and burning cease, no new wheals are developed, and those which are present disappear without desquamation or pigmentation. There are several varieties of acute urticaria, which, owing to their peculiar features, require special description.

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[1] Medical Bulletin, December 1889.

URTICARIA PAPULOSA.—This form of the disease is also known as lichen urticatus. It occurs almost always in young children, and particularly in those who are improperly fed or poorly nourished. It is characterized by the development of a number of small, isolated papules, which usually appear suddenly, and after remaining for a day or two gradually disappear. The lesions are in size from a pin's-head to a split pea, and are developed around the hair-follicles. They are generally bright-red in color, except at the centre, which is white or paler than the periphery. They may appear upon any portion of the body, but are most numerous upon the extremities. In some cases the papular eruption is accompanied, or followed, by the development of a number of minute vesicles. Urticaria papulosa causes intense itching, and, as a consequence, the little patient resorts to scratching for relief, frequently tearing off the apices of the papules or vesicles and covering the surrounding skin with excoriations, which remain after the papules have disappeared.

URTICARIA BULLOSA.—This is a rare form of urticaria. It is characterized by bullæ as well as by large wheals. In some cases the eruption consists at first solely of wheals, which are gradually converted by excessive exudation into bullæ. They may become so large as to resemble those which are formed in pemphigus. They are accompanied by severe itching and burning sensations.

URTICARIA NODOSA.—This variety is also known as giant urticaria, and is of rare occurrence. It is characterized by the sudden development in the skin and subcutaneous connective tissue of large tubercles or nodules, in size from a chestnut to a small egg. They are hard to the touch, elevated above the adjacent surface, and seldom appear upon the face. They are the seat of intense burning and itching, but generally disappear in a few hours.

URTICARIA HEMORRHAGICA.—This form of urticaria is usually seen as a complication of purpura. The latter is, however, the primary and more important affection. The wheals are due to the irritation produced by the lesions of purpura, and are ephemeral in character. Neighboring wheals may coalesce, forming large hemorrhagic elevations.

URTICARIA INTERMITTENS.—In this variety the eruption appears regularly every two or three days, or on a certain day each week, and after remaining for a short time disappear, to reappear again at the end of the same interval. It may or may not be accompanied by febrile symptoms.

Urticaria may occur in connection with malaria, rheumatism, Bright's disease, scarlatina, measles, variola, pertussis, asthma, and various nervous and gastro-intestinal disorders. It frequently is a complication of scabies and pityriasis. It has also been observed as a sequel of arsenical poisoning.

CHRONIC URTICARIA.—In chronic urticaria the eruption recurs at regular or irregular intervals for months or years until the source of irritation is discovered and removed. In some cases a fresh crop of wheals appears daily. The itching and burning sensations are less severe, however, as a rule, than in the acute variety, and are sometimes absent. Constitutional symptoms may or may not be present.

**Diagnosis.**—The diagnosis of urticaria is easy. The sudden appearance of the characteristic wheals, their brief duration, their disappearance without desquamation, and the accompanying itching and burning sensations, form a complexus of symptoms that are not present in any other disease. The only affections that present any resemblance to urticaria are erythema simplex and erythema multiforme. In *erythema simplex*, however, the patches of hyperemia are larger than those in urticaria. They are uniformly red in color, are not elevated above the adjacent surface, and are unaccompanied by the subjective sensations of urticaria. The eruption of *erythema multiforme* sometimes closely resembles that of urticaria. It is more permanent in character, however, usually remaining unchanged for several days, and is not attended by any marked itching or burning sensations. *Urticaria nodosa* might be mistaken for *erythema nodosum*, but the nodules of the latter affection are painful to the touch and remain for several days, while those of the former usually disappear in a few hours. Urticaria bullosa can be distinguished from *pemphigus* by the presence of wheals and course of the disease. Facial urticaria has been mistaken for *erysipelas*, but a consideration of the history, the ephemeral character of the eruption, and the absence of the constitutional symptoms of erysipelas, should prevent that error from being made.

**Pathology.**—The lesions are due to a sudden exudation of serum into the upper layers of the skin. The vaso-motor system and muscular fibres of the corium are intimately concerned in their production. The first step consists of irritation either direct or reflex of the cutaneous vasomotor nerves. This produces spasmodic contraction of the cutaneous vessels, followed by dilatation and exudation of serum. The secondary dilatation of vessels is denied by Unna, who has excised and examined wheals produced on his own person by nettles. He supposes the existence of spasm in the large cutaneous veins which contain muscular tissue. In consequence of this spasm, a stasis of the local lymphatic circulation ensues. The superficial and deep vessels of the corium are involved.

More or less migration of white corpuscles takes place. The muscular fibres of the skin remain in a state of contraction, and by forcing the blood toward the periphery produce the pale centre and hyperemic areola of the eruption.

**Etiology.**—Urticaria is due to direct or reflex irritation of the peripheral vaso-motor system, and is produced by external or internal causes. Among the former are bites of mosquitoes, bed-bugs, fleas, and other insects, also hornet- or bee-stings, or contact with a star-fish, jelly-fish, or stinging nettle and other plants. The hairs of the caterpillars of several species of moths excite urticaria when in contact with the skin. A number of instances have been recorded in which the odor of essential oils gave rise to an attack. It may also be occasioned by too heavy or tight clothing in warm weather, flannel underclothing, or articles of apparel colored with poisonous (often arsenical) dyes. It is sometimes seen in consequence of applications of the electric current. Persons who have delicate skin and a nervous temperament are peculiarly liable to be attacked by urticaria when they become exposed to any source of irritation. In some persons of a markedly nervous type the characteristic wheals of urticaria are produced by the slightest irritation. Lines drawn upon the skin by a blunt-pointed instrument such as a pencil are almost immediately followed by the eruption. In this way the wheals may easily be caused to form the outline of white letters with pink borders. To this phenomenon the French have given the name of *autographism* or *demographism.* It usually occurs in the subjects of hysteria. Purely hysterical autographism, however, differs from true urticaria in that neither smarting nor itching attends the development of the lesions. Autographism occurs in a certain proportion of cases of locomotor ataxia and syringomyelia.

Among internal causes, gastric and intestinal disorders hold the most prominent place; in fact, ninety per cent. of the cases can be traced to some disturbance of the alimentary canal. Excessive drinking of wine or beer, or over-indulgence in rich food, may develop a copious eruption at any time. Certain articles of diet, such as fish, oysters, lobsters, crabs, shrimps, pork, sausage, cucumbers, and mushrooms, are well known as being especially promotive of an outbreak, particularly if eaten during warm weather. It is probable that the irritation is then due to fermentative changes or to a special poison generated by decomposition of the offending substance before digestion is completed. In other cases the attacks always follow the ingestion of particular varieties of food, such as rice, oatmeal, strawberries, raspberries, and buttermilk, and are dependent upon an individual idiosyncrasy.

The eruption sometimes develops so soon after ingestion of the offending substance that it would seem to be due to reflex nervous influence. Owing to a similar idiosyncrasy, outbreaks of urticaria sometimes succeed the administration of quinine, salicylic acid, salicylate of soda, kairin, antipyrin, iodide of potassium, turpentine, chloral, cubebs, copaiba, arsenic, and valerian. Injections of diphtheria antitoxins are frequently followed by urticaria. Intestinal worms are occasionally a source of the affection. Urticaria may be provoked by menstrual and uterine disorders. Dr. Manton, of Detroit, has described two cases in which urticaria developed in women who were approaching the climacteric period. In a third case an unmarried woman was attacked several months after ablation of the ovaries. Dr. Frank has reported the case of a woman who, at each menstrual period, was attacked by severe urticaria which within two hours invaded the entire body. The left ovary and tube being diseased, salpingotomy was performed, since which time the urticaria had not reappeared. It may be caused by disturbance of the genito-urinary organs in males; and in susceptible subjects by fright, anger, or any intense emotion. Dr. Davoli observed an unusual case of urticaria in a hysterical woman, the beginning of the eruption being always accompanied by extreme agitation of the whole body, and even by convulsive movements, chattering of the teeth, loss of consciousness, and the sensation of impending death. There was also very marked dyspnea, with elevation of temperature and albuminuria following the crisis. It may occur after or during an attack of variola, scarlatina, measles, rheumatism, Bright's disease, asthma, purpura, pertussis, neuralgia, and other nervous disorders. Nettle-rash sometimes occurs in patients suffering from hydatid cysts. A cubic centimeter of filtered fluid from a cyst was injected by Debove under the skin of three individuals who had never had urticaria. In two of these characteristic wheals were developed, whence it may be inferred that the lesions were due to auto-intoxication from absorption of the liquid. Affections of the liver, chronic gastritis, and dilatation of the stomach may also be productive of attacks of urticaria. Chronic or recurring urticaria is frequently due to malaria; in other cases it is dependent upon gastric or intestinal derangements. Lithemia and other disturbances of the organs of elimination are also potent causes in its production.

**Treatment.**—The most important consideration in the treatment of an attack of urticaria is to discover and remove the exciting cause as soon as possible. In acute cases, inquiry should be made as to the nature and amount of the food recently partaken of; if the indications point to it as the disturbing cause, and there is reason to believe that it is still in the stomach, apomorphine may be given hypodermically (0.001 gm. to gr. $\frac{1}{60}$), or an emetic of ipecacuanha, mustard, or salt and water, should be administered at once. Immediate relief can often be obtained by free vomiting. If several hours have elapsed since the offending substance was swallowed, the probability is that it has passed into the intestinal canal, and emetics will be of no avail. A full dose of the mild chloride of mercury, castor oil, sulphate of sodium, sulphate of magnesium, or Rochelle salts, should then be given to secure free purgation, and followed by smaller doses once or twice daily until recovery is complete. It is well to restrict the diet to bread, milk, and soup for a few days. Cold water and carbonated waters are not at all objectionable, but wine, beer, and other alcoholic liquors and condiments, such as pepper, ginger, or mustard must be rigidly avoided. In those in whom the attack can not be traced to any particular article of food, relief can usually be obtained by regulating the diet and directing the patient to take five grains of blue-mass at bedtime, and a mild saline aperient in the morning. In cases in which there is marked acidity or irritability of the stomach, and the urine is scanty, high-colored, and strongly acid, bicarbonate of potassium in ten-grain doses every two hours will be found invaluable. Acetate of potassium, liquor potassæ, and bicarbonate of sodium are also of service. When the irritability of the stomach can not be traced to any assignable cause, I have obtained marked benefit by the administration of oxalate of cerium in ten-grain (0.60 gm.) doses, either alone or combined with a sixteenth of a grain (0.004 gm.) of morphine. Bismuth, belladonna, dilute hydrocyanic acid, ether, chloral, and chloroform will also be found at times beneficial; likewise the mineral acids. In all cases, however, one or two movements of the bowels should be secured each day.

According to Lassar, an attack may often be cut short by salicylate of sodium in doses of twenty-four grains (1.5 gm.), thrice repeated at intervals of two hours.

In the subacute variety, the following combination will generally afford prompt and often permanent relief:

| | | |
|---|---|---|
| ℞ Magnesii sulphatis | ℥ss. | 16. |
| Ferri sulphatis | gr. xij. | .72 |
| Acidi sulphurici dilut. | fℨj. | 4. |
| Aquæ | q. s. ad f℥iij. | 96. |

M. Sig.: Two teaspoonfuls, well diluted, three times a day.

Alkaline mineral waters may also be administered with benefit. In chronic urticaria the source of irritation should be diligently sought for and removed. The food should be light and nutritious, and the clothing warm and non-irritating. If lithemic or gouty symptoms are present, great relief can often be obtained from:

| | | |
|---|---|---|
| ℞ Tinct. aconiti | ♏ xvj. | 1. |
| Vini colchici rad. | fℨijss. | 10. |
| Potassii acetatis | ℥ss. | 16. |
| Aquæ | f℥iijss. | 112. |

M. Sig.: Dessertspoonful in water three times a day.

If digestion is slow or incomplete, good results may be derived from the administration after meals of ten grains (0.60 gm.) of pepsin, one grain (0.06 gm.) of ipecacuanha, and one-fortieth (0.0015 gm.) of a grain of strychnine. Apollinaris or Vichy water, unrestricted as to quantity, is beneficial in these cases, and often aids materially. Quinine in five-grain

(0.30 gm.) doses, three times a day, will be invaluable in cases of an intermittent type, as well as in chronic urticaria, though, according to Quinquaud, Fowler's solution is generally more efficacious. Guéneau de Mussy administers thrice daily a pill containing one and a half grains (0.09 gm.) each of powdered jaborandi and extract of guaiac with three grains (0.18 gm.) of benzoate of lithium. Pilocarpine hypodermically or by the mouth, is, in the opinion of some writers, an excellent remedy in both acute and chronic urticaria. Brocq recommends a pill of three-fourths grain (0.045 gm.) each of quinine and ergotin, with one-fiftieth grain (0.001 gm.). extract of belladonna, from eight to sixteen pills being given during the twenty-four hours, with two hours' interval between doses. If the patient be decidedly rheumatic or gouty, he combines about one-eighth grain (0.008 gm.) extract of colchicum with one-quarter grain (0.015 gm.) digitalis, and administers from two to eight during the day. Salicylate of sodium or the bromide of lithium will sometimes effect a cure when quinine has failed. They are especially indicated in those attacks which depend upon the rheumatic or gouty diathesis. Arsenic, atropine, chloride of ammonium, sulphur, naphthol, and the sulphites and hyposulphites are of value in some cases. Ichthyol may occasionally prove useful in chronic urticaria. The remedy from which I have obtained the best results, in obstinate cases, however, is sulphurous acid. I usually give it in doses of from one-half to one drachm (2 to 4 gm.) three times a day, well diluted with water. In those cases which are dependent upon nervous causes, Dr. Nitot ascribes an almost specific virtue to antipyrin. In one case the eruption appeared periodically each day. Seven and a half grains (0.5 gm.) of antipyrin were administered two or three hours before the expected time of attack. After four days of this treatment the urticaria permanently disappeared. In cases due to reflex irritation from the genital organs, prompt relief is effected by drachm doses (4 gm.) of the fluid extract of salix nigra. Bromide of potassium is also serviceable. Cases attended with chronic constipation which have resisted other treatment may be benefited and often cured by hypodermic injections daily of two to four drachms (8 to 16 gm.) of castor-oil. The use of laxative pills containing cascara extract and purified ox-bile is also serviceable, if given after each meal. If there is decided evidence of intestinal fermentation, creosote or salol may be added to this treatment. For the relief of the distressing itching and soreness, Blaschko also found antipyrin of value. For infants he prescribes:

| | | |
|---|---|---|
| ℞ Antipyrin | ʒss. | 2. |
| Syrup. simpl. | f℥j. | 32. |

M. Ft. sol. Sig.: Half a teaspoonful at night before going to bed.

Occasionally he has known larger doses to be necessary.

Attention has been called by Dr. Riffat, of Salonica, to strophanthus as a remedy in acute and chronic urticaria. His plan is to give the tincture in doses of fifteen to twenty drops during the twenty-four hours. He states that, in the acute form, a single dose will often be followed by the disappearance of the wheals as well as the itching. In five cases of subacute, acute, and chronic urticaria, Stein obtained satisfactory results from administration of the iodide of potassium after failure of the salicylate of sodium, atropine, quinine, and strophanthus.[1]

External treatment is of prime importance in both acute and chronic urticaria. The itching and burning sensations are usually so intense as to demand immediate attention. All tight, coarse, or improper articles of clothing, and other external sources of irritation, should be removed, and soothing applications made to the affected surface. Various lotions and ointments may be used for this purpose. In some, cold water, either in the form of a douche or the cold compress, will be sufficient. In others a lotion, composed of equal parts of vinegar and water, will be found beneficial. Another excellent application is composed of one part of whiskey and two parts of water. Sometimes a hot mustard foot-bath gives almost instantaneous relief.

Gratifying results can usually be obtained from the use of alkaline lotions or baths, containing a drachm (4 gm.) of bicarbonate of sodium or a drachm and a half (6 gm.) of bicarbonate of potassium to the gallon (4,096 gm.) of water. Weak phenol lotions will often be found useful. I sometimes use:

| | | | |
|---|---|---|---|
| ℞ | Phenolis liq. | fʒss. | 2. |
| | Spts. vini rect. | fʒiv. | 16. |
| | Aq. camphoræ | f℥vj. | 192. |

M. Sig.: Apply externally.

The official creosote-water may also be employed with advantage. Another efficacious application is:

| | | | |
|---|---|---|---|
| ℞ | Tinct. aconiti | fʒj. | 4. |
| | Aq. menth. pip. | f℥iv. | 128. |

M. Sig.: Use as a lotion every hour.

A solution of menthol five grains (0.30 gm.), and water one ounce (32 gm.), is a good remedy. A variety of other lotions have been recommended: benzoic acid ten grains (0.60 gm.), alcohol four drachms (16 gm.), water six drachms (24 gm.); chloral thirty grains (2 gm.), water one ounce (32 gm); chloroform five minims, alcohol one drachm (4 gm.), water four ounces (128 gm.); corrosive chloride of mercury two grains (0.12 gm.), water four ounces (128 gm.); dilute hydrocyanic acid ten minims, water three ounces (96 gm.); dilute sulphuric acid one drachm gm.), water eight ounces (256 gm.); citric acid two drachms (8 gm.), ater six ounces (192 gm.); acetic acid one drachm (4 gm.), water five nces (160 gm.); carbonate of ammonia one drachm (4 gm.), water four nces (128 gm.). One part of ether to two parts of lukewarm water is commended. Sweet spirit of nitre, plain or diluted with water, or irit of Mindererus and alcohol in equal parts, have sometimes proved ficacious. The following combination will frequently be found useful, pecially in chronic cases:

---

[1] Münchener med. Wochenschrift, October 7, 1890.

| | | | |
|---|---|---|---|
| ℞ Hydrarg. chlorid. corros. | gr. ss. | 0.03 | |
| Tinct. benzoini | fʒijss. | 10. | |
| Glycerini | fʒij. | 8. | |
| Aq. rosæ | f℥vj. | 192. | M. |

A lotion containing belladonna and also many ointments may be nployed with advantage. I sometimes use:

| | | |
|---|---|---|
| ℞ Phenolis liq. | ʒss. | 2. |
| Camphoræ | ʒj. | 4. |
| Chloral hydrat. | ʒj. | 4. |
| Ung. aq. rosæ | ℥ij. | 64. |

M. Ft. ung. Sig.: For external use.

Another excellent combination is:

| | | |
|---|---|---|
| ℞ Bismuthi subnitratis | ʒij. | 8. |
| Ung. veratrinæ | ℥j. | 32. |

M. Ft. ung. Sig.: Apply externally.

The ordinary oxide of zinc ointment is also a serviceable application. may be improved by the addition of a little phenol. An ointment conining twenty grains (1.30 gm.) of acetanilid to the ounce (32 gm.) lieves the itching and tingling. The distressing itching may also be leviated by diachylon, menthol, cocaine, naphthol, belladonna, or ichthyol ntment. In chronic cases, great benefit can be obtained from the emoyment of baths containing half an ounce (16 gm.) of dilute nitro-hydroloric acid to the gallon (4,096 gm.) of water. Salt-water baths are of ue. Warm baths containing sulphurated potassa, as recommended by mieson, are likewise beneficial. Two ounces (64 gm.) of the salt are led to thirty gallons (122,880 gm.) of water. Quinquaud, on the conry, asserts that chronic urticaria is aggravated by the use of baths, and mmends envelopment of the affected parts whenever practicable in on-wool.

A Russian military surgeon, M. N. V. Chebayer,[1] in a case of giant ria affecting a soldier (probably the result of exposure to extreme originally), which had persisted for four years, and had resisted all ordinary means of treatment, used the following combination hypodermically:

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[1] New York Med. Jour., Jan. 20, 1906, p. 143.

| | | |
|---|---|---|
| ℞ | Quininæ hydrochloridi | 0.06 |
| | Antipyrin | 0.40 |
| | Aquæ destillatæ | 12. |

As the result of a single injection of 1 c.c. (♏ xv.) of this solution, the urticaria is said to have abruptly and definitely disappeared.

**Prognosis.**—The prognosis of urticaria is favorable in the great majority of cases. Where the lesions occur in the mouth and larynx, however, suffocation may be threatened. Acute cases can be promptly relieved by appropriate treatment, and frequently subside spontaneously without any medication. Relapses may occur from time to time, but they are as amenable to treatment as the primary attack.

Chronic urticaria is a more stubborn affection, and sometimes baffles all treatment for months, but it disappears when the irritation which produces it is discovered and removed.

URTICARIA PIGMENTOSA.—A brief description may be given here of a rare affection which has been termed urticaria pigmentosa by some writers, and xanthelasmoidea by others. It manifests itself during infancy or early childhood. It is characterized by the sudden appearance of wheals, tubercles, or large papules, which are elevated above the surface, and vary in color from pink to yellow or dark-brown. They remain prominent for several days or weeks, and then slowly subside, leaving large, green, brown, or yellow pigmented and indurated spots to mark their location. In some cases the wheals do not disappear, but remain as permanent new formations in the skin and subcutaneous connective tissue. The eruption is accompanied by intense itching and burning, and more or less constitutional disturbance. The pathology of this affection is unknown. An eruption resembling this description has followed the administration of veronal, but in most cases no drug intoxication has been observed. Some observers regard it as a distinct disease, while others believe it to be only a variety of urticaria. The treatment should be palliative and symptomatic.

ACUTE CIRCUMSCRIBED EDEMA OF THE SKIN OR ANGIONEUROTIC EDEMA.—This condition bears a certain resemblance and perhaps relationship to urticaria, with which it has probably often been confounded. It was first particularly described in 1876 by Milton,[1] who unfortunately bestowed upon it the name of giant urticaria, which is now applied to urticaria nodosa. Subsequently cases were reported by Quincke, Strübing, and others under the title which heads this paragraph, and Dr. M. B. Hartzell has published[2] an account of a case which came under his care.

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[1] Edinburgh Medical Journal, 1876.

[2] University Medical Magazine, May, 1890.

The affection usually develops upon the face, though other portions of the body may be attacked. The edematous swelling is generally soft, pitting upon pressure, but occasionally it is hard and no indentation can be made upon it. The tumors vary considerably in size, sometimes being as large as a fist. The skin which covers them is usually unchanged in color, at times it is reddened. When persistently red and swollen, the condition has been termed *angioneurotic erythema persistens*, by Jos. C. Bloodgood.[1] As a rule, the only sensation experienced is that of tension. The trouble is apt to make its first appearance during the night, twenty-four hours often sufficing for its development and retrocession. The lesion develops rapidly, and is of comparatively brief duration. Most often it is rapid also in its disappearance. Frequently but one tumor is produced; sometimes two or three may coexist, but the number which simultaneously appear is never large. As a result of recurrent attacks the skin may lose its elasticity and hang downward in a fold. The disease may attack the mucous membrane of the mouth, tongue, or larynx, and give rise to difficult respiration or deglutition. Alarming dyspnea has, in fact, been produced, and in one case death occurred from edema of the larynx. In some instances, the dyspnea has preceded the evolution of the cutaneous lesion. Most of the cases reported have been accompanied by symptoms of gastro-intestinal disturbance. In a minority of the cases the patients were also subject to attacks of urticaria; and in some, the lesions of urticaria and of edema were both present. Generally, the two do not coexist. A number of cases have arisen from prolonged anxiety or severe grief, but in others no cause could be detected. There seems to be a strong tendency to heredity, and Osler alludes to a family in which cutaneous edema could be traced through five generations. The disease once established is liable to recur frequently for an indefinite period. Tonics and laxatives are employed, but the treatment is unsatisfactory. In Hartzell's case small doses of the salicylate of sodium together with a saline laxative appear to diminish the frequency and severity of the attacks.

ANGIONEUROTIC ERYTHEMA.—Under this title, Joseph C. Bloodgood[2] has reported cases which appear to be dependent upon inflammation affecting the roots of teeth, as the swelling frequently recurred in the same area. It was undoubtedly caused by reflex irritation. In these patients benefit was obtained by surgical treatment by neurectomy.

A condition somewhat analogous to the preceding is known as scarlet rash or scarlatiniform erythema, in which the vaso-motor nerves are locally affected by toxins or by reflex irritation from the intestinal tract.

SCARLATINIFORM ERYTHEMA.—Cases occur in which repeated attacks of erythema appear and are followed by free desquamation. The latter commences from the second to the fourth day. It differs from angioneurotic erythema in not having decided swelling, or edema, and from *scarlatina* in being non-contagious, and in not being attended by fever, or sore throat. The glandular system escapes entirely, or is only slightly affected. As the rule, the kidneys remain intact and in no case does a true nephritis develop. The eruption appears at irregular intervals, and the relapses are not always milder than the original attacks. The condition is probably due to gastro-intestinal intoxication. Its chief interest consists in the fact that it is likely to be mistaken for scarlatina. The majority of cases of so-called relapsing scarlatina, according to Cozzolino,[1] are instances of scarlatiniform erythema.

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[1] Johns Hopkins Hospital Bulletin, No. 146.

[2] Johns Hopkins Hospital Bulletin, vol. xiii, No. 146.

## ECZEMA.

SYNONYMS.—Scabies humida—Crusta lactea—Eczêma—Ekzem—Tetter.

Eczema is a non-contagious, inflammatory affection of the skin, acute or chronic in character, appearing at its beginning in the form of any one of the elementary lesions, such as erythema, papules, vesicles, pustules, or a combination of them, accompanied with itching, more or less infiltration, and frequently attended by a discharge, and finally leading to the formation of crusts or scales.

**Symptoms.**—Eczema, which is a manifold, changeable, and polymorphous affection, may appear as one or all of the results of inflammation, either successively or simultaneously. It may also be followed by secondary results of inflammation such as a discharge, with the formation of scales and crusts, fissures, abscesses, edema, and hypertrophy.

Eczema is decidedly a variable affection, often changing rapidly from one to another elementary form. In one case, erythema may begin the series of symptoms, and the diseased surface may in turn become moist, infiltrated, dry, and desquamating. In another the affection may be manifested by the appearance of groups of either papules, vesicles, or pustules, alone or commingled, seated upon bases which are more or less inflamed, and attended by some or all of the local symptoms of inflammation, such as discoloration, pain, itching, smarting, or burning, swelling, heat, tension, with functional disorder of the part. In some rare cases, marked constitutional symptoms supervene, especially when an extensive surface is involved. In others, the vesicles which are formed may burst or rapidly change by accidental infection to pustules, and so give rise to a red, weeping surface from the poured-out products, which quickly form yellow, gum-like crusts, from the drying up of this discharge. The eruption may now either suddenly or slowly undergo a change of form from the red, moist, and excoriated state to a more or less infiltrated, reddened, dry, fissured, and slightly desquamating condition of the surface. Again, the only evidence of the eczematous disease in still other instances may be the development of fissures or cracks, and this occurs especially upon the palmar and plantar surfaces, depending upon infiltration, and rendering every movement extremely painful, and at times completely incapacitating the sufferer from actively using the parts affected. Furthermore, several or many of these lesions may appear, or manifest themselves, in turn in the same case. It will also be found that more or less infiltration is a prominent feature in every case of eczema. The fluid which escapes from the vessels with some leucocytes is either retained in the meshes of the corium, these becoming organized and producing thickening, or, as is more frequently the case, is discharged and forms crusts on the surface. The appearance of this discharge is not, as was formerly held, the diagnostic feature of eczema. It may or may not be present, and its appearance depends entirely upon the form of the disease. In the event that either the vesicular or the pustular lesion is developed, the fluid exudation may be very great, as well as the thickening, crusting, and desquamation. On the contrary, should the erythematous, papular, or fissured form appear, desquamation and at times thickening may supervene, but no crusting; and the amount of the secondary changes that occur will depend entirely upon the stage of the disease, the age and state of the constitution, the seat and extent of eruption. In short, these are briefly some of the many phases under which this changeable disease appears from time to time—a disease which is essentially different from all other cutaneous eruptions in the development of both the primary and secondary lesions, which frequently undergo, either rapidly or slowly, many changes in their form, often appearing as several varieties in the same subject, or being accompanied with marked and peculiar secondary changes due to infection and traumatism.

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[1] Rivista di Clin. Pediat., Feb., 1903.

The prominent and, at the same time, the most constant symptom of eczema is paresthesia, or *itching*. It may be so slight in some as hardly to attract any attention, while in others it may be intolerable. The extent and degree of this symptom will, however, vary according to the amount of irritation, the location of the eruption, and the power of resistance of the individual. In some cases and in certain localities, as, for instance, on the palmar and plantar surfaces, itching and all other subjective symptoms are at times absent. In others the symptoms of itching may be accompanied with a disagreeable burning, prickling or tickling sensation, or the latter unpleasant impressions may alone be present. Occasionally in neurotic cases of eczema, though rarely, pain may be the prominent local manifestation present.

Eczema may be acute, subacute, or chronic, the acute appearing and running its course for several days or weeks, and finally disappearing, or remaining in a subacute condition for a time, to develop again into the acute form upon the least irritation, or to subside gradually into a chronic commences from the second to the fourth day. It differs from angioneurotic erythema in not having decided swelling, or edema, and from *scarlatina* in being non-contagious, and in not being attended by fever, or sore throat. The glandular system escapes entirely, or is only slightly affected. As the rule, the kidneys remain intact and in no case does a true nephritis develop. The eruption appears at irregular intervals, and the relapses are not always milder than the original attacks. The condition is probably due to gastro-intestinal intoxication. Its chief interest consists in the fact that it is likely to be mistaken for scarlatina. The majority of cases of so-called relapsing scarlatina, according to Cozzolino,[1] are instances of scarlatiniform erythema.

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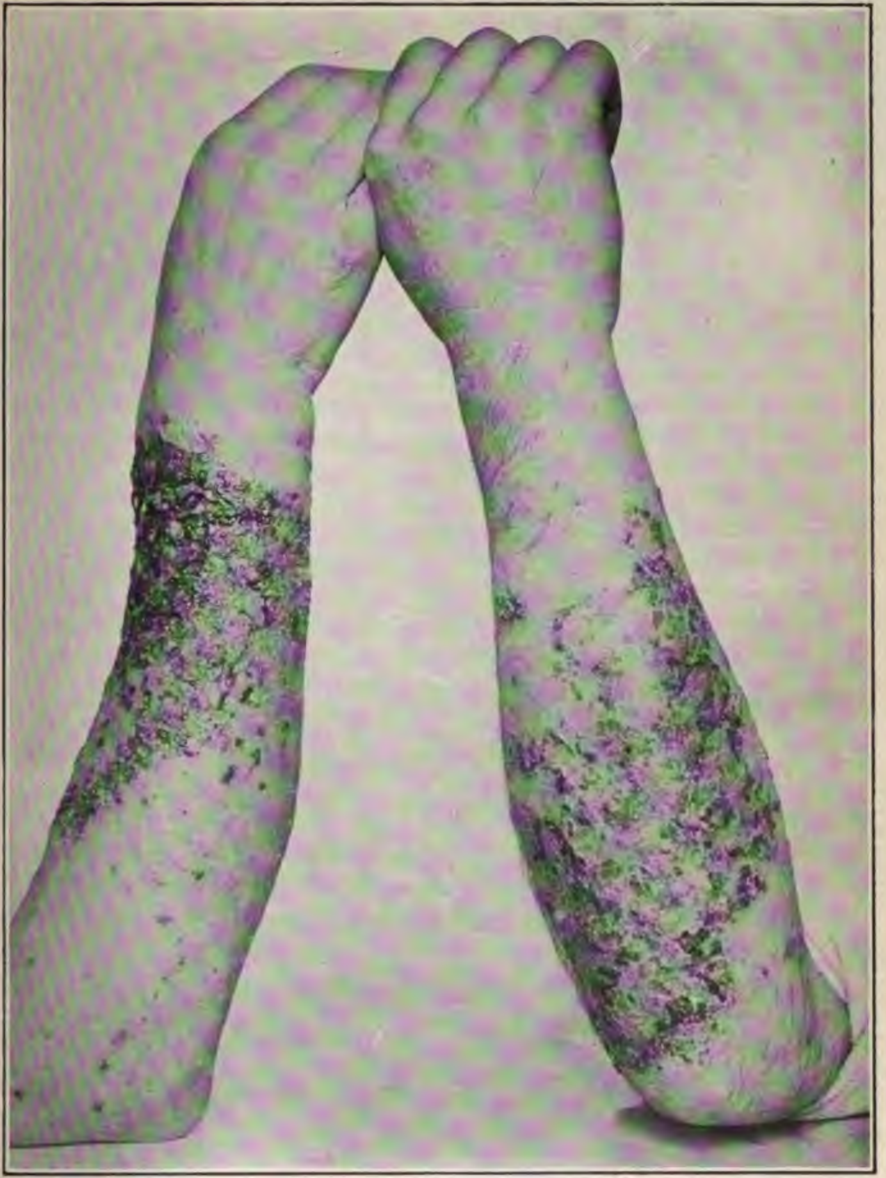
Eczema may be acute, subacute, or chronic, the acute appearing and running its course for several days or weeks, and finally disappearing, or remaining in a subacute condition for a time, to develop again into the acute form upon the least irritation, or to subside gradually into a chronic state, and so remain for an indefinite period, unless the condition is overcome spontaneously or by appropriate treatment.

ACUTE ECZEMA is characterized by inflammatory redness, attended by itching, smarting, burning, or tingling of the skin, together with swelling, heat, tension, and functional disorder of the parts. These initial local symptoms may attack all or part of the body, and may be mild or severe according to the locality invaded, and may at times be ushered in with restlessness, horripilation, trembling, as well as sleeplessness, gastric and intestinal irritation, and fever. Suddenly the reddened skin, which may also be edematous and swollen, may be covered with a greater or a less number of minute vesicles, papules, pustules, and scales, alone or commingled. In place of vesicles, papules, or pustules appearing, the surface may simply present a reddened condition, with or without swelling or the formation of scales; and the epidermis may in some instances be rapidly stripped off, leaving the raw exuding corium exposed beneath it. If the eruption be distinctly vesicular in character, which is usually the case, the lesions either dry up, or, more probably, quickly rupture, giving exit to their contents, which often cause considerable irritation to the surrounding parts, after which the secretion is formed into yellowish or brownish scabs, together with some scales. The eruption of acute eczema, if not excited by further irritation, will usually subside in a few days or a week; the tendency to the inflammation will, however, linger for some time in the tissues, to break out again from the least exciting cause. It is more often the case that the eruption, after disappearance for a short interval, will again recur and gradually pass into the subacute variety. Thus it may be seen from this brief outline that eczema may be said to be acute when the eruption is of short duration, the inflammatory symptoms high, the primary changes prominent, and the secondary slight or insignificant. The course of acute eczema is occasionally complicated with lymphangitis, adenitis, or abscess, and may be followed by an eruption of boils owing to accidental infection of the skin with pyogenic germs by the nails or from the clothing.

SUBACUTE ECZEMA is a variety in which the inflammatory action is less marked than in the acute. It is often represented by the period of decline in the acute eruption, in which the surface is reddened, slightly thickened, moist, and covered more or less with crusts and scales, or groups of papules or pustules, from which issues an ichorous fluid, occasioned by being torn by the scratching as the result of the intense itching, the pus from the pustules usually drying into yellowish, gummy crusts. Any slight or severe irritation from a constitutional or local cause may rapidly bring the eruption again into an acute eczema, or it may gradually, or from frequent relapses and scratching, which bring fresh morbid appearances and deeper changes in the skin, subside into the third variety.

PLATE XI



Fore-arms from Two Cases of Localized Eczema. (See page 376)

Chronic Eczema.—The line which separates the acute, subacute, and chronic varieties from each other is not sharply defined. Chronic eczema may be preceded by an acute attack, or the disease may be subacute or chronic from its commencement. The appearance in the chronic stage coincides in every respect with those already described—to wit, the vesicles, the papules, the pustules, and the red, weeping surface covered with scales and crusts. But something more will also be observed, namely, marked swelling, thickening, and a hard and often fissured state of the skin, attended with intolerable itching. Eczema may therefore be said to become chronic from a persistence of the eruption, with frequent relapses, causing the secondary changes to predominate over the primary lesions. The changes leading to chronic eczema will, of course, vary according to the peculiarities of the region which is invaded, the duration of the eruption, and the effect of numerous external influences upon the part. While all parts of the body may become the seat of chronic eczema, nevertheless some portions, from their peculiar anatomical formation, especially those which are richly supplied with sebaceous glands and follicles, are particularly subject to this stage of the disease. Thus, for example, the head, the flexor surfaces of the joints, the groins, the scrotum, and adjacent parts, are surfaces in which the eruption lingers longest, and settles in the skin. These changes will also depend upon the length and thickness of the hair, the amount and extent of attention to the skin and its appendages, the form and method of the dress, and the habits and occupation of the subject. Again, the duration of the attack will have an important bearing upon the condition of chronic eczema. Thus, in protracted cases, the exudation will be increased, the swelling and thickening greater, and the tendency of the affection is to spread to both adjacent and distant parts, or eventually to cover all the body.

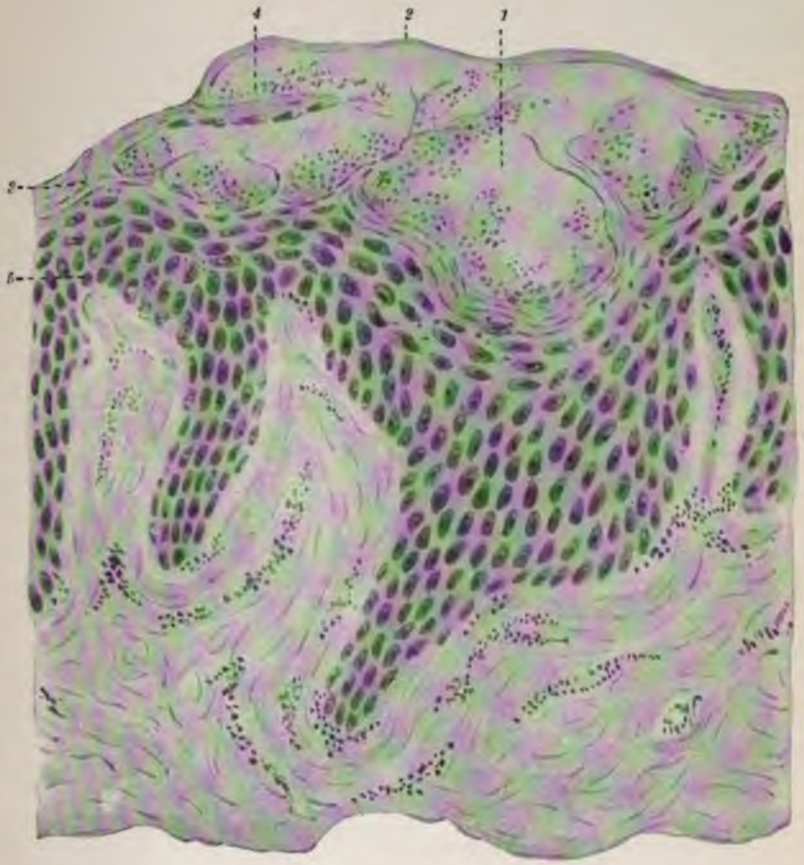
In some cases the infiltration extends so deeply that the thickened integument is scarcely movable upon the underlying connective tissue. Further, the air and irritating substances coming in contact with the affected parts, either from the clothing or implanted by scratching, constitute external agents which modify very much the appearance of chronic eczema. It is not uncommon, as Besnier has especially pointed out, for a patch of eczema to persist indefinitely, and become, as it were, a starting-point for successive acute attacks involving other portions of the body.

The form in which the eruption of eczema manifests itself varies according to the predominant pathological lesion which may be present. At its commencement it may assume an erythematous, vesicular, papular, or pustular form, or a combination of these lesions. It may occur either as a limited or as an extensive eruption, with lesions of every size and shape, and arranged in single or multiple patches. The four clinical varieties of eczema, which may follow in succession as stages of the disease, will now be respectively described *seriatim*.

ECZEMA ERYTHEMATOSUM (*Erythematous Eczema*).—The prominent lesion in this variety, from the beginning to the end, is erythema. It usually appears as a small or large red patch, attended with a certain amount of heat, swelling, and itching; the spots may be of any size and shape, but are generally undefined in outline, gradually passing imperceptibly into the surrounding healthy skin. The color of the skin is subject to great variation in the same and in different individuals, according to the exciting cause, the condition of the system, and the seat of the eruption. At times the change of color may be almost imperceptible to the naked eye, the subjective symptoms of itching or burning alone being felt, while at others the color may vary from a bright-red to a violaceous hue, or even a yellowish complexion, which old erythematous eczema often acquires. The color, as is frequently the case, may be uniformly diffused, or, exceptionally, it may be mottled, and appear as blotches upon the affected surface. This variation in color can usually be observed upon some portion of the face, in which it is now pale; or a bright red, and again a dull shade. As this latter form is more commonly seen at a time when the skin is darker in hue, as in middle-aged adults, the general color is then of a dark-red tint. Some swelling may be present, the extent, of which will largely depend upon the locality invaded. After the eruption has existed for several days, the surface has a peculiar hard and rough feel, by reason of the interference with the free action of the glands and the absence of the normal unctuous material. It also becomes covered with fine scales. There is usually experienced at this time, a feeling of tension, burning, and irritation, with either slight or severe itching. Moisture and all signs of a fluid discharge are commonly absent, unless the epidermis has been stripped off, exposing the corium beneath. The initial lesion, therefore, that is alone present is erythema, although in some instances minute vesicles and papules can be seen upon close and careful observation. The portions of the body thus invaded are generally the face and genitalia, although the disease may attack any part of the surface.

Erythematous eczema, when seated upon the face, may give rise to conjunctivitis. This form, which is very liable to relapse, may remain localized to a small patch, or it may, as is usually the case, rapidly or slowly spread over a large surface. The morbid action is apt to be both variable and capricious in course and intensity. This variety of eczema may disappear for quite an interval, to return again; or may improve to-day, to reappear to-morrow; or it may cease for weeks or months, to relapse again without any assignable cause. External and internal influences which modify the circulation, such as sudden changes of temperature, violent exercise, excesses of the table, and the use of spirits, are often the active factors in these repeated relapses. Eczema erythematosum may therefore either continue in the manner stated, or, as a result

## PLATE XII



Vesicle of Eczema. (See page 379)

*1*, Vesicle broken up into imperfect loculi. Septa composed of flattened epithelial cells.
*2*, Top of the vesicle.
*3*, Floor formed by flattened epithelium.
*4*, Leucocytes and epithelial debris in vesicle.
*5*, Proliferated stratum Malpighian.

of the frequency of its attacks and a change of its stages, together with the appearance of secondary lesions, gradually pass into the chronic form of the disease. It may, on the other hand, terminate by delitescense or resolution, which is marked by a rapid or gradual diminution of the redness, heat, and swelling, and by a relief from the subjective symptoms. Further, the termination of the process may give rise to a slight desquamation of the epidermis or to the appearance of small areas of healthy skin between and in the affected patches. As has been noted, this variety of the disease is liable to undergo certain changes, depending upon the locality, the exciting cause, and the external influences; as for example, when the lesions occur upon two surfaces that are in apposition, as about the breast, the axillary spaces, the groins, the nates, and the genitalia, a moist, weeping surface results, which is known as eczema intertrigo or eczema mucosum, and usually terminates in desquamation. Frequent relapses, from some exciting cause, increase the infiltration and cutaneous irritation, which leads to scratching; excoriations and crusts follow in turn, being marked secondary changes of other manifestations of eczema. Erythematous eczema generally occurs in middle-age, or old, persons.

ECZEMA VESICULOSUM (*Vesicular Eczema*).—This variety of the affection is characterized at the outset by the formation of minute vesicles. Typical eczema is not, however, necessarily limited, as was formerly thought, to the development of this particular lesion, which has thus led to much confusion by practitioners searching always for vesicles, or the catarrhal discharge, on which to base their diagnosis. The formation of vesicles and other lesions to be described later, is merely one manifestation, or one of the successive stages of this variable affection. Typical vesicular eczema may be ushered in with sharp pyrexia, headache, loss of appetite, thirst, coated tongue, and either diarrhea or constipation. These constitutional symptoms are, however, usually present only when the morbid process is intense and the surface involved extensive. The affected part, for a short time prior to the appearance of the eruption, feels hot, tumefied, tense, and irritable, after which minute red points, or a diffused redness, appears, attended with itching, burning, or prickling, which is often very great, and only ceases or lessens shortly after the appearance of a greater or less number of minute vesicles. The erythema which precedes the development of vesicles varies in color, being in some cases of a pale rose, and in others of a deep red hue. The borders of the diseased area are usually ill defined and of irregular contour. The vesicles vary in size from a pin's point to the head of a large toilet-pin, and are either discrete, or, as is more frequently the case, are closely packed together, quickly coalescing, forming patches, and often becoming confluent. In some instances blebs of considerable size are produced and simulate the lesion of pemphigus. Each vesicle contains clear serum, or an opaque or yellowish fluid of an alkaline reaction, sticky to the touch, and which stiffens the linen with which it comes in contact. In some of the mild cases, especially if the eruption be discrete, the vesicles dry up in the course of six or eight days and the minute white or dark scales of epidermis, which cover them, drop off, leaving the skin in its normal condition. In other instances, which is far more frequently the case, the vesicles burst in their earliest stage from the excessive congestion and the effused serum in the tissue, or from scratching induced by the intense itching, before being seen by the physician, and expose a surface which is more or less excoriated. This surface, which is now swollen, hot, and red, pours out a serous fluid, which dries into light or dark, thin, yellow, and gummy crusts. The vesicles either continue to appear in successive crops, or the excessive effusion is poured out so rapidly on the former site of the vesicles that no reparative process can occur, hence no vesiculation, and in place of that lesion a small or large quantity of a syrupy, or ichorous, fluid (the latter usually predominating), comes directly to the surface, dries at once into crusts, or runs off in drops, which at times are taken up by the meshes of the linen. The morbid action under such circumstances has now reached its height; the amount of secondary changes which are present will depend upon the state of the patient's system, the attention to the parts, and the extent of scratching or other irritations, as, for example, the access of air to the surface. At times the swelling alone is the most prominent and marked feature on the surface, the vesiculation being very slight, eczema edematosum giving the part an appearance very closely resembling erysipelas. Typical vesicular eczema usually presents the features just described. It will be found that erythema, papulo-vesicles, vesico-pustules, pustules, and many other lesions, are also frequently associated with the vesicular eruption. The lesions of this variable affection are thus often so thoroughly commingled that it is at times out of the question to say which one predominates. The eruption may show itself either upon a small surface, or it may involve part or all of the body. Vesicular eczema frequently occurs upon the face of adults as well as in children, and can also be observed about the hands, particularly upon the fingers. The most prominent subjective symptom is itching, which persists with so much intensity as to bring about an irresistible desire to scratch the parts, and so afford relief after the vesicles have burst or have been torn and the serum has been permitted to escape and the tissues are benumbed. The serum which has been poured out in this manner, and which thus checks or lessens the itching, may in turn cause considerable irritation both to the affected patch and the surface with which it comes in contact. The act of scratching may cause the discharge to become sanguinolent, and frequently causes infection and the appearance of secondary lesions. The irritation sets up a burning sensation, which is as annoying and intolerable as the itching. This teasing subjective symptom may also be attended with itching in addition, should another crop of vesicles appear; or sometimes, with the eruption of a fresh crop of vesicles, the burning subsides and is succeeded by itching. The subjective symptoms are always more pronounced in the case of nervous, irritable subjects.

Acute vesicular eczema may continue for a few days or weeks, and slowly subside with the drying up of the vesicles or the lessening of the swelling and the discharge. The redness gradually fades, the margin of the affected patches becoming less distinct, the crusts loosening and falling off, exposing a surface covered with scales, beneath which can be observed reformed, soft, tender, and delicate epidermis. The skin generally remains in a somewhat red, tender, and delicate state for some time after the inflammation has entirely disappeared from the part. In the event that delitescence or resolution will not take place, the vesicles may pass into pustules, or relapses may occur, and thus produce the inflammatory form, eczema rubrum, or gradually pass into the chronic variety.

ECZEMA PUSTULOSUM (*Pustular Eczema*).—This form of eczema is known also as impetiginous eczema, because it resembles, but it distinct from impetigo. The lesions may be developed as pustules at the outset, or change by accidental infection from either the erythematous, papular, or vesicular varieties—more commonly from the latter—into the pustular form of the disease. The pustules are, therefore, in the majority of instances, formed in the same way, and from the vesicles, their initial stage, to which they are closely associated, and are often commingled with the vesicles. In fact, the two lesions, with their secondary changes, are so blended that it is not only difficult but may be impossible to decide which was originally the prevailing primary lesion. Usually minute vesicles appear either alone or in groups, and slowly enlarge, attain a firmer consistency, and become distended with a purulent secretion. These pustules, from the accumulation of the purulent secretion and consequent distention, or from any irritation, burst, and the poured-out ichorous secretion dries into greenish-yellow or dark-colored scabs and crusts, which become friable, and, falling or crumbling off, expose a red, tender, and irritable surface. The ichorous secretion also frequently gives rise to considerable irritation of the surrounding surface. The subjective symptoms of heat, swelling, and itching are mild, except in aggravated cases. In this latter class the pus formation and infiltration are often very great. If the morbid process in these cases occurs upon the hairy parts, especially the scalp, and the sebaceous glands are involved, the discharge becomes mixed with altered glandular secretion, mats together the hairs in an inextricable mass, causing intense itching, sometimes a rancid odor, and great disfigurement. When this is the case the disease is both distressing to the patient and obstinate to the ordinary course of treatment. Pustular eczema is very common in the lymphatic and the debilitated, in those who are poorly fed and who do not receive proper care, especially in young children. It may attend pediculosis. It may occur upon all or any part of the body, but as a rule is confined to a limited surface. It shows itself most frequently upon the scalp and face, especially in children. In this form of eczema the neighboring lymphatic glands become swollen, and upon secretion they are found to contain streptococci which also have been detected in the urine, associated with albumin.[1]

Eczema Papulosum (*Papular Eczema*).—In this form, often incorrectly called lichen, the predominant lesions are papules; although imperfect papules, partially developed vesicles, and even pustules, may also occur. Sometimes a papule is surmounted by a vesicle. The eruption appears as small, round, or acuminated hard papules, of different sizes, from a very small, to a large, pin's head. They vary in color from bright to dark red, are usually formed quickly, remaining for days or weeks, to disappear or reappear, and often persist for a long period. In some cases the papules are discrete, in others confluent, and seated upon a reddened base. They may be distributed over the entire surface, or limited to one or more regions. The subjective symptoms are more marked and violent than in the other varieties previously named, consequently the summits of the papules are usually scratched or torn, causing them to bleed. Papules will therefore often be seen having upon their apices a drop of dry blood, and the normal skin around and between them may likewise be covered with excoriations from the scratching. Papular eczema is most common during adult life and old age. It usually invades the arms and lower extremities, especially the flexor surfaces, together with the trunk and thighs. While papular eczema, in typical cases, begins and ends with the formation of papules, yet in very many the latter lesions develop into vesicles, and even pustules, or the eruption is preceded by red, scaly patches, or all varieties heretofore noticed are present at the same time side by side—papules, isolated or in groups, usually predominating. Again, typical papular eczema, when torn from scratching caused by the intolerable itching, will often be followed by a weeping state of the surface, irrespective of the presence of either vesiculation or pustulation.

Usually the eruption, after reaching its climax, gradually declines as resolution is accomplished, leaving only a slight redness and some desquamation as evidence of the previous inflammation of the skin, but the morbid process may be indefinitely prolonged by secondary changes. Papular eczema is prone to exacerbations and relapses.

All of the four chief varieties of eczema just considered may become intensified, and often chronic, as a consequence of secondary changes resulting from continued morbid action. Special forms will now be discuss[illegible]

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[1] [illegible] igo, et d'Eczéma impetigineux des Er[illegible]
[illegible] ordeaux, May 5, 1907, p. 277.

Eczema Rubrum, or Eczema Madidans, is the most severe form of the disease. For a day or two preceding the appearance of the eruption the affected part is the seat of itching, and, at the same time, constitutional symptoms are often manifested, such as loss of appetite, malaise, and fever. In drunkards, the fever may be accompanied by extreme agitation and delirium. The systemic manifestations vanish with the development of the eruption. Eczema rubrum may result from either the erythematous, vesicular, pustular, or papular varieties, and is characterized by a reddened, weeping, or tumefied, hot, and often shining surface, and at times covered with sero-purulent exudation. A portion or all of the epidermis may be shed, or, as is more common, the exposed and excoriated corium gives free exit to serum or an ichorous secretion, and often also to blood. The discharge, which varies in quantity according to the grade of the inflammation, dries into yellowish or yellowish-black crusts, which often partially or completely cover the eczematous surface, remaining for an indefinite period, unless removed artificially, the morbid action in the mean time going on beneath. If the crusts are removed by artificial means, a red, angry, swollen, and, it may be, an oozing surface is exposed. This form of inflammatory eczema ordinarily becomes chronic in character, marked infiltration follows, and the parts involved become hard, rough, and thickened. It increases in severity, and shows no tendency to spontaneous cure. This form of the disease may occur upon any portion of the body, but is especially observed to follow the erythematous variety about the flexures, as in the axillæ, about the elbow, the wrist, and the cleft between the nates and the groin. It is also noticed on the scalps and faces of infants, and the lower extremities of persons of advanced years.

Eczema Squamosum.—Squamous eczema is a subacute or chronic form of the disease, in which exfoliation of the superficial layer of the epidermis is a marked feature. It may show itself either at the declining stage of any form of eczematous eruption, or last during the entire course of any of the varieties of eczema. Squamous eczema may be present with erythematous eczema, and often succeeds it. It also frequently follows the papular form, especially when the lesions coalesce, forming confluent patches. In marked cases of squamous eczema, the reddened, dry, and scaly patches are of all sizes and shapes. The extent and amount of desquamation depend upon the locality invaded and the persistency of the eruption.

In addition to the desquamation there is also more or less infiltration f the affected surfaces. Squamous eczema may be prolonged for an definite period of time.

Eczema Fissum.—Fissured or cracked eczema is a chronic form of disease, which is generally observed upon those portions of the animal dy which are in almost constant motion. It shows itself particularly upon those parts in which the epidermis is usually very thick, as, for example, on the palmar and plantar surfaces. A peculiar mottled appearance in the parts of the hands and feet above referred to is at times observed before the cracks are formed from the congested true skin beneath, or the surface may have a white or dark leathery appearance, and be hard, dry, and unyielding. Fissures usually follow in these cases as the result of the primary congestion, the product of which is either unable to find ready exit through the thickened epidermis, or an escaped serosity excites a marked irritability of the now inelastic skin, which tears and cracks upon the slightest motion. Fissures are not confined to these surfaces, but may be found on any part of the body, and are especially noticed about the mouth, the joints, the fingers, and the toes. They may occur upon any portion of the surface of the skin, but are usually seen in the course of the natural furrows. Sometimes the fissures may be superficial and slight, as noticed on the ends of the fingers and toes, or they may be extensive, as found about the mouth and on the palmar and plantar surfaces.

When the cracks are deep and extensive, they show the red and angry true skin beneath, and cause great pain and intense suffering upon the least movement; especially is this the case when the feet are involved. Some individuals have a peculiar predisposition to this form of eczema, usually in winter, the least change in the atmosphere producing fissures upon some portions of their integument. The debilitated, the poorly nourished, the strumous, the tuberculous, and those who depress and lower the vital powers of their body by mental cares, overwork, and the various forms of dissipation, are especially liable to be afflicted in this manner.

The slightest irritation in such subjects, such as the handling of irritants, exposure to the variations of the weather, frequent use of water and soap, will set up a fissured state of the skin. Thus, individuals, working in certain occupations, having a tender and often poorly nourished skin, are very great sufferers from cracking of the integument. I have frequently noticed this to be the case in compositors; in wool-pickers, the irritation being caused in some cases by the wool, in others by the dye in the wool; in mill-hands handling dyes and dyed goods; in plasterers; in those working considerably in water, and in many other manual occupations in which the hands come in contact with irritating substances. In addition to the secondary changes already mentioned, the integument from the morbid eczematous action may become exceptionally thickened or hypertrophied; in the latter event large and shapeless masses of [illegible] with or without ulceration, or the surface may be hardened and [illegible] entire or in patches, edematous or warty. The latter states [illegible] by various writers by the names E. sclerosum, edema- [illegible], but the use of these terms only confuses the [illegible] increases the number of the varieties of eczema.

In fact, in such cases the atrophy and hypertrophy which occur are directly the result of the congestion, with the attendant special deviation of tissue nutrition leading to either thinning, hardening, an edematous state, or papillary growth in the parts. These secondary changes will be referred to more in detail when considering the local manifestations of eczema.

SEBORRHEIC ECZEMA.—Novel views upon the nature and origin of chronic eczema have been advanced by Unna since the appearance of the first edition of this work. These doctrines were detailed in a paper read before the Dermatological Section of the Ninth International Congress.[1] After declaring himself dissatisfied with a mere routine diagnosis of chronic eczema, and after distinguishing briefly the nervous eczema of dentition and tuberculous eczema, he proceeds to describe what he has termed seborrheic eczema. This form usually originates upon the scalp, spreading thence to other portions of the body, especially to such as are normally well provided with hairs. For the fatty material hitherto attributed to disordered secretion of the sebaceous glands, Unna declares, upon the ground of his own investigations and those of Malassez and Schuchardt, is in reality derived from the sudoriparous glands. Instead of exhibiting augmented activity, the sebaceous glands are occluded by abnormally compact masses of epidermis. That the perspiratory glands are the source of this fat, Unna conceives is proved by the identity of the fat found in the cutis, epidermis, and epidermic scales with the fat of the coiled glands; by the increased activity and inflammatory changes in the coiled glands; by the dilatation of the sweat pores and the constant increase of their normal products.

Seborrheic eczema begins insidiously upon the scalp, and generally first attracts attention by an unusual scaliness or collection of crusts, attended by severe itching. The agglutinated scales may simply increase in quantity, but remain white and only moderately fatty; they may accumulate as fatty crusts between the hairs, or catarrhal symptoms may become more pronounced and weeping occur. The fatty scales are lost and the usual appearance of eczema is approximated. Thus three varieties of seborrheic eczema are differentiated. The first of the three corresponds to what is usually called pityriasis capitis, the second is the so-called seborrhea sicca, the third includes a large number of cases hitherto grouped as chronic eczema of the scalp. The sternal region, next to the scalp, is the favorite seat of seborrheic eczema, with which Unna would identify that form which has been known as seborrhea corporis, lichen annulatus serpiginosus (of Wilson) or the eczema marginatum of the French.

A patch of seborrheic eczema has a yellow color with an outer fine-red border when the scales have been removed. It spreads by fresh outbreaks of characteristic raised papules and yellowish-white or yellow crumbling fatty scales, the centre of origin changing into a yellow-colored, quite smooth, but slightly scaling spot. In the axilla crusts are scarcely ever seen, the yellow color of the centre of the patch is usually absent, and the disease tends to assume the moist form and spread rapidly over the thorax. The diagnostic points of this variety of eczema are given as follows: The spread of the affection downward, generally in the middle line of the body; the invariable history of seborrhea; the fatty and crumbling character of the scales and the yellowish color of the whole affection; and the configuration of the separate lesions, "the thickened plaques spontaneously flattening out in the middle or on one side, the red color changing to a yellow, and the scaly surface becoming smooth, to suddenly again break out at the margin in a raised, red, scale-covered, bow-formed wall." Gamberini has made many experiments in order to ascertain whether fat is secreted by the sweat-glands, but has met with no success. He regards any affection of the sebaceous or sudoriparous glands in eczema to be secondary, and concludes that seborrheic eczema can only be looked upon as a distinct form of eczema in consequence of its attacking certain regions rich in glands. A secondary implication of the glands and a commingling of their secretions with the serous exudation characteristic of eczema may alter the typical appearance of the latter disease. Dr. William H. Merrill, of Pepperell, Mass., has recently discovered two varieties of diplococci in the scales of seborrheic eczema. In fact, as stated by Van Harlingen, such a variety of organisms have been found in connection with the disease, that it is difficult to assign an exclusive causative rôle to any particular one. This is the view now generally held, rather than the hypothesis that it is due to some specific form of parasite.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, December, 1887.

**Diagnosis.**—It will be seen from the description already given that eczema is one of the most common of eruptions, and it is therefore of the utmost importance to distinguish it from the many diseases with which it is liable to be confounded. Eczema is the most variable of affections, but it has certain general phases differing from all other diseases. Thus it appears now as simple redness, vesiculation, papulation, or pustulation, with primary or secondary changes, alone or combined; again presenting a weeping or moist surface with or without the above changes; or with a mixture of all these lesions in their various stages. This protean disease has some main features invariably present, and may be indicated as follows: Redness and itching are constant symptoms, the former being either mild or severe, the latter being so slight as to occasion little or no inconvenience, or so intense as to be almost unbearable. Again, infiltration or thickening, varying of course in degree, is present in almost every case and stage of the disease. Finally, the continuous exudation of fluid or plastic material is another characteristic feature of eczema, a symptom that, in the majority of cases, appears during some stage of the disease. It is, in fact, a symptom present only in eczema, and is recognized by the trickling or flowing, in small or large quantities, of either a clear, milky, yellowish, or dark serum, or serum mixed with blood. This discharge, weeping, or moisture of the surface quickly dries into more or less yellowish, greenish, or brownish crusts, often seated upon the above moist base. While eczema has these general conditions, which separate it from all other cutaneous affections, yet there are certain diseases which resemble it. The diagnosis can therefore be better and more accurately drawn by referring to the characteristic features of each eruption that is liable to be confounded with it.

Erythema.—This affection is a hyperemic condition, and is usually of short duration, with an absence of all the inflammatory symptoms of eczema. Thickening, vesiculation, papulation, crusting, scaling, and itching, so characteristic in eczema, are wanting in erythema.

Acute Zymotic Diseases.—Acute eczema might be mistaken at first for one of the acute zymotic diseases on account of the constitutional disturbance that may be present; however, the systemic disturbance is greater, the fever more constant, and the peculiar features of eczema are absent. Scarlatina, erysipelas, and small-pox are the most prominent affections with which eczema is liable to be confounded. In scarlet fever there is not only the history, perhaps, of contagion, but the rapid and irritable pulse, the peculiar state of the tongue, the involvement of the fauces, the appearance of the eruption, the second day of the illness, on the neck and face, and then spreading all over the body, desquamating about the eighth or ninth day—a series of symptoms that never occur in any variety of eczema. Erysipelas, especially of the face, resembles in some respects eczema. Erysipelas is usually a severe disease, with more or less constitutional symptoms, accompanied with a shining, tense, and swollen state of the parts, with a smarting or burning sensation; no discharge occurs, except after the disease is well established, or when blebs follow, or in its decline, or in the phlegmoides, or grave variety—symptoms which are peculiar to erysipelas and are absent in eczema. Further, erysipelas spreads rapidly, tends to invade the scalp and all adjoining regions, with a well-marked line or border between the affected and natural skin. Eczema, on the other hand, never passes through these rapid changes, rarely invades the scalp from the face, and the outlines of the patches are poorly defined. Lastly, small-pox in its papular stage may be mistaken for papular eczema of the face and upper portion of the body; but in small-pox, the gastric disturbance, fever, headache, and lumbar pains, and the eruption on the hard and soft palate, are sufficient to remove all doubt.

Herpes.—Herpes and herpes zoster sometimes resemble eczema, although the vesicles in the latter are smaller and are not as flat as those in the former affections. The peculiar grouping and definite but short course of herpes, the vesicles situated on a red base, which do not rupture but dry up, are sufficient to differentiate between it and eczema. Herpes zoster is attended with neuralgic pains, which are not present in eczema, and the eruption is distributed along the course of a nerve.

Lichen.—Papular eczema is sometimes called lichen, but a wide difference exists between the two diseases. In lichen there is often a gouty diathesis, and the general health may be affected, while in eczema there is little or no systemic disturbance. The papules of lichen develop slowly, undergo no change during their entire course, while those of eczema appear rapidly, frequently passing into other lesions. The papules of lichen are flat, pink-colored, covered with minute scales, with their centres somewhat depressed, while those of eczema are pointed and have a smooth, bright-red surface. Lastly, it will be observed that lichen-papules are followed by pigmentation, which will not occur in eczema. Scratching or rubbing the skin, may produce eczematous lesions in a case that originally was lichen planus, and thus cause a difficulty in diagnosis.

Sycosis.—The diagnosis between pustular eczema and sycosis of the beard is often difficult. Sycosis is an inflammation of the hair-follicles, beginning in the deeper portions, ascending to the surface, loosening the hairs, which can be easily removed without pain, and developing pustules, papules, or tubercles, or all combined. In eczema the inflammatory action is superficial, commencing in the papillary layer. The hairs are not usually loosened except in very severe or chronic cases, and on extraction give rise to severe pain. In some exceptional cases the inflammation in eczema may involve the deeper structures; the pus, passing down, gradually loosens the hairs, but this is rare. The process may, in addition, extend to the surrounding regions devoid of hairs; in sycosis the follicles alone are involved, unless accompanied by some complication. In sycosis, there is very often a deep-seated pain or stinging sensation, with more or less tenderness, while, in eczema, itching is generally the most prominent symptom.

Dermatitis.—Simple inflammation of the skin, known as dermatitis, produced by heat, poisons, acids, alkalies, or any substance that may excite such a condition, is distinguished from eczema by its history and the rapid disappearance of the eruption on the withdrawal of the cause.

Rosacea.—Erythematous eczema is distinguished from rosacea by its more general infiltration and distribution over the face and adjoining region. Eczema is present at all periods of life, rosacea more especially at puberty, middle and old age. In rosacea there is usually evidence of acne-spots, scars and dilatation of the superficial capillaries, furnishing e best indications of the disease not being eczema.

Psoriasis.—Typical psoriasis, with its small red, slightly elevated s, or larger patches covered with peculiar whitish scales, which can not easily be removed, and, when torn away, exposing a bleeding corium, should not be mistaken for eczema. The eruption in psoriasis may, through the use of medicine, or the advance of the disease, change, the infiltration becoming more marked, the scales disappearing, and such a condition may in many respects resemble eczema. The history and course of psoriasis will always point to a dry, uniform eruption, characterized by the presence at one time of many whitish scales, and involving by preference the scalp and extensor surfaces. On the contrary, eczematous patches will show a history at some time of moisture and a polymorphous eruption, the spots fade gradually into the healthy skin, the scales if any are present, are thin and sparse, and the disease involves by preference the flexor surfaces. As both affections may involve the scalp, the diagnosis is sometimes difficult. The patches in psoriasis are well defined, manifesting a tendency to clear in the centre, and the scales are abundant and dry, while in eczema the infiltration gradually shades into the healthy skin, there being no tendency in the beginning to heal in the centre, and the scales are thin and scanty.

SEBORRHEA.—Seborrhea may be mistaken for eczema, especially on the scalp and other hairy parts. In seborrhea sicca there is no discharge, the surface is simply covered with yellow, flat, or often dirty-colored, greasy crusts, which upon removal expose a surface that is either pale and not at all altered, or red and dry, at times slightly glazed, and showing distended sebaceous follicles. In eczema, on the contrary, there is often a discharge with infiltration, the scales are drier, less abundant, and well attached to a thickened and hyperemic surface. In seborrhea oleosa there is a discharge, but it is oily, and not of the fluid or plastic nature of that of eczema. In some cases these two affections may exist at the same time, or the one precede the other. Thus, severe seborrhea may excite eczema, and *vice versa*, and in such states the history and course of each case, with a clear understanding and separation of the local changes, will demonstrate which affection has been primary and which secondary.

PEMPHIGUS.—The large isolated blebs of pemphigus vulgaris are never observed in eczema. That variety described as pemphigus foliaceus bears some resemblance to eczema, but the history, course, and symptoms, particularly the constitutional disturbance in the former, and the absence usually of itching and infiltration, always exclude the latter affection.

SCABIES.—This disease often presents a resemblance to eczema—because more or less eczema is frequently caused by the scratching or friction of the skin in cases of scabies. All the lesions of eczema may be observed during its course; the vesicles are, however, more scattered, not so confluent, and have connected with them little black lines or furrows, at the ends of which the itch-mites are imbedded, and may be detected by the aid of a needle and the microscope. It often happens in scabies that these furrows have been destroyed by scratching or by treatment. The only way, therefore, of distinguishing scabies from eczema, or detecting the exciting cause is by the history of contagion and the locality affected. The contagiousness of the disease, and its attacking by preference certain regions, as the fingers, hands, anterior surface of the arm, and axillæ in both sexes, the breast and nipple in the female, the penis in the male, and the buttocks in children, are strong proofs against the eruption being primarily eczema. Sometimes even these valuable indications fail, from an inability to glean any history of contagion, and the part or parts involved may be in such a high state of inflammation, from scratching and applications, as entirely to mask all the evidence of the true nature of the disease. In that event the diagnosis will depend upon the results of treatment. The use of antiparasitics will lessen the irritation and afford relief if it be scabies, but if it be eczema there will be no change, but rather an aggravation of the eruption. In a person predisposed to eczema scabies may give rise to a genuine attack of the former affection.

SYPHILIS.—The lesions of syphilis are sometimes mistaken for eczema, but it much more frequently happens that an ordinary inflammation of the skin is termed a specific affection. In syphilis, whether of the erythematous, vesicular, papular, or pustular variety, the history of infection, the signalization of the introduction of the poison into the system by syphilitic fever and other constitutional symptoms, the involvement of the glands and mucous surfaces, and the presence of either stains, ulcerations, or cicatrices, are characteristic features which are wanting in eczema. It occasionally happens, however, that even with these evidences the diagnosis is difficult, especially in eruptions of the scalp, face, and genital regions. Syphilitic lesions that involve these parts usually present the following features: On the scalp a pustular eruption, or red and raw patches with adherent crusts and slight superficial ulceration, and sometimes cicatrices, also the presence of an unpleasant odor not occurring in eczema; on the face, particularly in infants, large, flat, red, and indolent papules, either separate or in circular groups, and somewhat scaly; on the genital regions the same form of lesion may be present, occasionally slightly changed by the moisture of the parts, or the surface may be red, raw, and indolent—symptoms with others that indicate the syphilitic nature of the eruption. The subjective symptom of itching, that is generally spoken of as being constantly absent in syphilitic eruptions, and relied upon often as a means of diagnosis between it and eczema, can not, as I have already stated, be depended upon in this condition.

TRICHOPHYTOSIS.—Ringworm, in various parts of the body, may
ate eczema, or it may, by scratching and applications, occasion, at
ne time, an eczematous eruption. Ringworm of the scalp is dis-
ed from eczema by the history of contagion; the diseased surface
irty, scaly, deadened, circular appearance, the outlines of the
ing sometimes erased in severe and chronic cases, and the hairs

lack lustre, are split up, and broken off. Ringworm of the beard is similar in appearance to that of the scalp with often more inflammatory action; the patches tend to clear in the centre; their borders are also somewhat elevated, scaly, and slowly creep from point to point; the hairs become loose; occasionally the surface is covered with papules, pustules, tubercles, and assumes a boggy condition. In eczema of the scalp there is usually moisture; scales, if present, are of a light color, covering a surface that is red, often infiltrated; the diseased patches are not so well defined, and the hairs are usually unaffected. When eczema attacks the beard, there is no tendency to spread in the manner just cited, or for the affection to disappear in the centre; the hairs are usually unchanged, and the inflammatory action is not so severe as in ringworm. All doubt can finally be set at rest by removing some of the scales or hairs, placing them beneath the microscope, and ascertaining the presence or absence of the fungus of ringworm.

Ringworm of the body is usually easily distinguished from eczema, by its beginning in a small point, and developing into red, circular, desquamating patches which tend to heal in the centre while spreading peripherally. Eczema and ringworm, however, occurring about the genitals have some points in common, in the red, raw, and intensely itching surface; and, in fact, the two affections may coexist, the eczema being excited by the irritation. The parasitic disease can always be detected by the advancing border of the eruption, and the use of the microscope will make the diagnosis positive.

Favus.—The peculiar, yellowish, cup-shaped, friable crusts of favus can seldom be mistaken for eczema, but the latter may occur as a complication. The appearance, however, of these characteristic crusts, or some cicatrices, and the presence of the parasite, as shown by a microscopic examination, would demonstrate conclusively the nature of the affection.

Lupus.—Lupus vulgaris can at all times be differentiated from eczema by its chronic and destructive course; the red, glazed, and scaly patch having soft, gelatinous tubercles around the border of the diseased surface. Lupus erythematosus may bear even a stronger resemblance to erythematous eczema, but the history, the firm attachment of the scales to the surface, the involvement of the sebaceous glands, and the absence of itching, are sufficient to distinguish it from the latter disease.

Pediculosis Capitis et Corporis.—Lice on the head or body will excite lesions which closely resemble eczema, and often give rise to an eczematous eruption, but the detection of the pediculi and their nits is all that is necessary to complete the diagnosis. Pediculosis may also occur on the scalp as a secondary complication of eczema, and in such cases the eruption may extend beyond these parts to the neck and face, or it may be seen on other portions of the body. Pediculosis corporis causes abrasions of the integument very much like eczema; the presence of hemorrhagic spots over the surface, especially around the shoulders and loins, should at once excite suspicion, and the finding of the lice and their nits on the body, hair, or in the folds of the clothing, establishes the diagnosis.

Pediculosis Pubis.—Crab-lice, which infest the inguinal and pubic regions, and at times also the thighs, abdomen, the front of the chest, the axillæ, beard, eyebrows and lashes, occasion an eruption which has been mistaken for eczema. When these regions are involved, a careful examination should be made, and, if the pediculi can be detected as dark specks clinging to the base of the hairs, the diagnosis is clear. Blue spots in the skin are often due to lice and have diagnostic value.

Dysidrosis.—This rare affection is of a vesicular nature, occurring upon various portions of the body, by preference the palms and sides of the fingers, and sometimes resembles eczema. The pearl-like vesicles which are developed in this disease are isolated, do not rupture, but dry up, and the epidermis after a time becomes macerated, thus differing very much from the same class of lesions in eczema in their formation, distribution, and course, the latter disease appearing also on other parts of the body and being attended with more marked inflammation of the skin.

Pityriasis Rubra.—This rare disease is distinguished from eczema by its uniform and intense redness, the abundant epidermic exfoliation, the marked symptoms of a burning sensation, itching and infiltration, so common in eczema, being usually absent.

Pityriasis Rosea or Pityriasis Maculata et Circinata.—Is almost invariably limited to the chest, abdomen, back and shoulders, sometimes the upper portion of arms and legs. Face and hands are rarely involved, lower legs and forearms also. There may be slight itching. The disease runs its course in three or four weeks and then disappears spontaneously.

Epithelioma.—Severe cases of this disease, with the ulcerated surface and hard, everted edges, do not in any way resemble eczema, but the superficial variety, which appears sometimes as a thin, scaly mass on the face, and on its removal, or being picked off, exposes a moist and often bleeding surface, which soon becomes covered again with the same kind of a crust, resembles to some extent, and is occasionally misnamed, eczema. The sharp, defined border in the form of epithelioma just referred to, together with the absence of thickening and the solitary or limited number of lesions, presents a marked contrast to the fading border, the infiltrated surface, and the multiplicity of the lesions of eczema, and its presence perhaps on some other part of the skin.

Paresthesia.—Paresthesia may give rise to a condition like eczema, or it may develop a secondary inflammation of the skin, owing to scratching and friction. The history of paresthesia, the absence of an eruption at the outset of the disease, the involvement of certain localities, the paroxysmal nature of the symptoms, and its occurrence in neurotic cases, and often at certain seasons of the year, distinguish it from eczema.

PRURIGO.—Prurigo, a very rare affection, in one case coming under my observation was mistaken for eczema. The chronic course of the disease, its development early in life, the formation of papules that may be of the natural color of the skin, pale or red, irregularly distributed, with predilection for the extensor surfaces, the enlargement of the inguinal glands, and the presence of spots of pigmentation, with the constant and irresistible desire to scratch, are all characteristic symptoms indicating a markedly different disease from eczema.

IMPETIGO AND IMPETIGO CONTAGIOSA.—In both these affections the pustules are larger and more isolated, and the resulting crusts are larger in size and darker in color than those of eczema. In pustular eczema, the eruption occurs in patches, or spreads until a large surface becomes red, raw, and secretes more or less pus, which dries into large, firm crusts, the opposite condition being seen in the irregularly scattered pustules of impetigo. In the contagious variety of impetigo there is usually a history of its spread by contact, or several members of the same household are affected by it.

**Pathology.**—The pathological changes in eczema will vary according to the stage and duration of the disease. In the acute stage the capillaries are engorged, and there may be a partial or diffuse redness of the skin, and an effusion of serum, plasma, and even blood may follow. Neumann[1] demonstrated these changes on the skin of animals by friction with croton oil. He selected for the purpose of his experiment a rabbit, and rubbed croton oil into the ear for ten or fifteen minutes, and watched its result for several hours beneath the field of the microscope. Rhythmical contraction of the vessels was first observed, they being at one time full of blood and at another empty; afterward dilated, followed by permanent stasis; the ears, which were normally transparent, now became opaque, swollen, hot, and, within a few hours, numerous vesicles appeared with serous contents. At the end of forty-eight hours the animal was killed, and the tissue was found to be filled with serous fluid and a great quantity of cells.

The researches of Biesiadecki[2] show the changes observed in both the papular and vesicular varieties. The papillæ are enlarged in breadth and length, being filled with serous fluid and cells; the connective-tissue corpuscles are remarkable for their size and number. Numerous spindle-shaped cells are observed, extending from the papillæ between the deepest cells of the rete mucosum, through which they crowd and prolong themselves even to the epidermic layer. The cells in the mucous layer form a dense network, penetrating it in all directions. Within this network are seen somewhat swollen epithelial cells, whose protoplasm has a granular appearance. This circumscribed infiltration of the papillæ develops the papule of eczema. In the continued development of this morbid action a vesicle is produced by an increase of the new formation of cells within the papilla, and the superficial cells of the mucous layer swell up, possibly rupture, and so elevate the epidermis. The spindle-cells are here found even more numerously acting as nutrient canals, and no doubt convey the element of nutrition to the mucous layer. In instances of rapidly developed eczema they are found in great numbers, and form a dense network. With the increased quantity of these cells there is likewise a larger amount of serum exuded, which is often so abundant as to push forward the epidermis, developing a bleb. The removal or rupture of this epidermis causes the fluid to ooze out, forming moist eczema. This poured-out product, which may be a clear yellow or milky fluid, differs in no way microscopically from ordinary serum. Biesiadecki states that when pus-cells are present they have their origin in the connective-tissue corpuscles. Virchow, Cohnheim, and other pathologists, on the contrary, have shown that pus-cells are derived both from the blood and the cell elements of the affected tissue. The investigations of Gaucher, Vulpian, Heitzmann, and others, also show that the epidermis, no doubt, plays a most active part in the initiative step of this disease. For example, according to Gaucher, vacuoles are formed within the mucous layer, seemingly by the distention of individual cells with fluid, which, uniting, form vesicles.

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[1] "Hand-book of Skin Diseases," New York, 1872, p. 167.

[2] "Beiträge zur physiol. und pathol. Anat. d. Haut." Sitzungsberichte der Wiener Akad., vol. lvi, p. 225, 1867.

Chronic eczema exhibits many different changes, depending entirely upon the duration of the disease. The skin is inflamed, but much less actively than in the acute variety; it is also thickened, hard and more or less infiltrated; the papillæ are enlarged, often to such an extent as to be observed, in some cases, by the naked eye. The infiltration may involve the entire corium, and may also extend even to the subcutaneous cellular tissue. According to the minute investigations of Unna[1] the positive characters of eczematous infiltration consist mostly of small, multiform connective-tissue cells, poor in protoplasm, lying closely together, and having a well but not very deeply stained nucleus. In addition, there may be pigment deposits in the mucous layer and corium, especially about the vessels, the lymphatics are enlarged, and, in long-continued inflammation, the fat-cells disappear, the connective tissue becomes hardened, and the follicles and glands may be destroyed. Finally, many of the changes just described point to the probable nervous origin of the eruption, which has been suggested, particularly by Fox, who believed that in eczema both cells and vessels play an important and somewhat independent part, in

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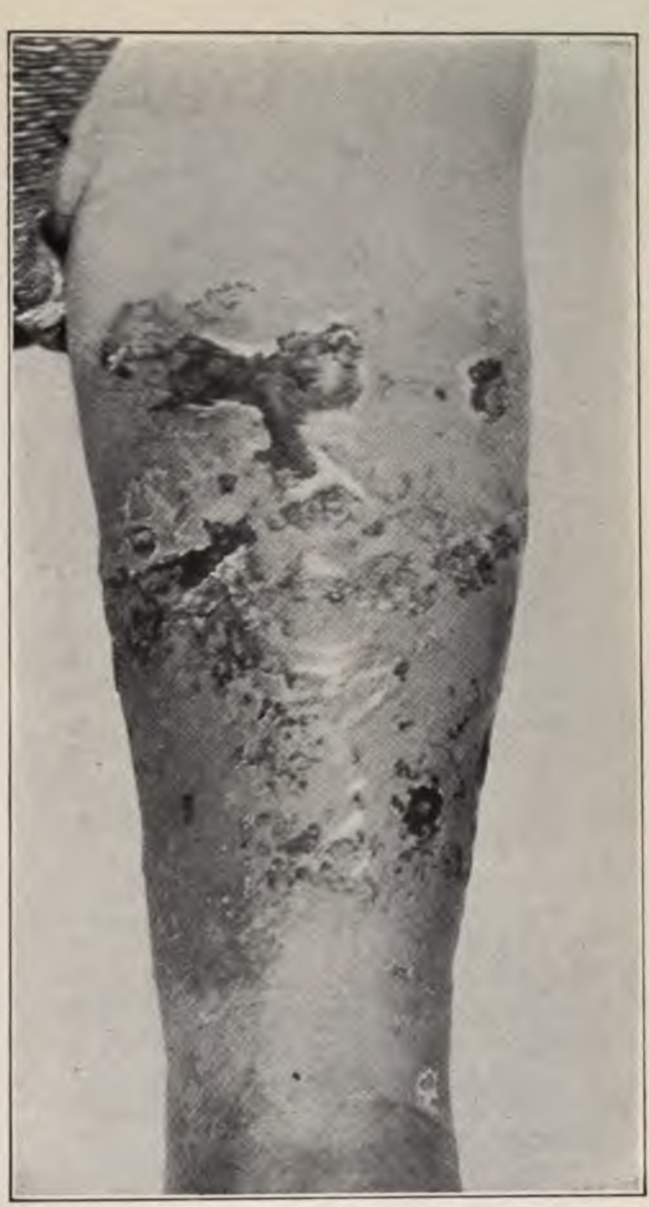
[1] "The Histopathology of the Diseases of the Skin." By Dr. P. G. Unna, Edinburgh and New York, 1896, p. 211.

PLATE XIII



Chronic Eczema with Ulceration of the Leg.

(*Patient improved markedly under treatment.*)

(See page 394)

obedience to a nerve paresis. Hebra was also of the opinion that faulty innervation is the most important element in the production of eczema. Bulkley, Bronson,[1] and others, have expressed similar views.

**Etiology.**—Eczema is one of the most common and obstinate affections of the skin. Statistics carefully compiled—which space at my disposal in a practical work of this nature will not admit of being given in detail, and, if stated, would not be of any special utility to the practitioner beyond the mere knowledge of figures—show eczema to be more frequent in certain countries than others. In the United States, and especially in the large cities, the percentage of reported cases of eczema among the cutaneous diseases appears to be greater than in Europe. In Philadelphia at least thirty to thirty-five per cent. of all cases of diseases of the skin coming under my observation are eczema. It occurs among all classes and at all periods of life, and is not infectious, but may in some cases be contagious. Clinical experience shows it to be rather more frequent in men than in women. Certain persons have a peculiar predisposition to the development of eczema; strumous subjects and those having light hair and complexion being more liable to it than those of the opposite temperament. The hereditary character of the disease can occasionally be recognized by tracing it to a part or the whole of the family, or to one or more generations. Individuals so affected are usually born with a weak skin, just as other organs of the body are often in a debilitated condition at birth. The skin of persons in ordinary health is not usually affected by any constitutional or local derangement, or, if so, only very mildly, and it quickly subsides. On the contrary, in the unhealthy the least change in the system, or the slightest external irritation, may develop an obstinate eczematous or other cutaneous eruption. Cases of this nature will generally be found to have also associated with them a derangement of some other part of the body, as, for instance, a functional disorder of one of the viscera. Eczema, from clinical experience, is therefore no doubt directly traceable in the majority of cases to some constitutional impairment, that may either be from a peculiar predisposition or from an acquired cause. In referring, which I shall next do, to the constitutional and local causes of eczema, I wish it understood that I believe, in speaking of the latter, that whatever may be the source of the irritation, the disease is developed usually when there is present some faulty condition of the system.

It is to be observed, moreover, that eczematiform eruptions due solely to local cause are confined to that portion of skin which has come into contact with the irritant substance, that the inflammation generally rapidly subsides, and that there is no tendency to successive attacks.

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[1] "Eczema, its Pathology and Treatment," Journal of Cutaneous and Venereal Diseases, vol. i, No. 5. p. 132.

CONSTITUTIONAL CAUSES.—The use of improper or even of proper food either in too large or too small quantities, especially in infants and growing children, acts as an exciting cause. Imperfect assimilation often supervenes under such circumstances, accompanied by the numerous disorders that it produces, any one of which would be sufficient for developing eczema. The retention in the system of the elements of gout and rheumatism from the above or even other causes, and their circulation in the capillaries of the skin, often furnish the exciting cause. Again, certain diseases of the viscera, especially of the lungs, heart, liver, and kidneys, and of the blood-vessels, are active in calling the disease into existence. A striking instance of this kind is found in imperfect action of the kidneys, the deficiency in excretion leading to the retention of the waste products, and thus inducing eczema.

The opinion was long entertained that the cure of an eczema, particularly if it affected an extensive surface or occurred in infants, was a dangerous procedure. Most modern writers have denied that this view contained any truth, but M. Gaucher, in the "Bulletin Médical," September 1, 1889, plausibly argues that it rests upon a reasonable basis. Chemical metastasis produces eczema in diabetes, gout, and Bright's disease, and, upon similar principles, the existence of a chronic eczema may point to its causation by toxic materials which are habitually eliminated by the skin. If the eruption be suppressed these substances accumulate within the organism, and may give rise to more serious consequences. His theory is founded upon nine observations, and he therefore advises that we should not hasten to heal the entire diseased area at once, but attack it in segments, that our local applications should not be too energetic, and that, in fact, we should endeavor to obtain full elimination through the kidneys and bowel instead of the skin. Besnier and Brocq likewise admit that the old opinion contains some elements of truth. The former advises that the kidneys should be carefully watched during the treatment of old cases of eczema of the legs and the chest in eczema of the trunk. Dr. Brocq remarks that in some cases an eczema makes its appearance upon the subsidence of neuralgia, migraine, asthma, or bronchitis, and that these diseases are apt to reappear if the skin trouble be energetically treated. It is not maintained that such relationship is frequent, much less that chronic eczema should receive no treatment. It is well, however, to observe caution in dealing with chronic eczema in those who have formerly been subject to such attacks to which allusion has been made.

Dr. Robert M. Simon[1] states the case of a child whom he attended account of an extensive eczema of the scalp and face, but who seemed rwise in good health. Two younger brothers had died of acute tuber-

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Wood's "Medical and Surgical Monographs," vol. i, No. 1, January, 1889.

culosis. The eczema was rapidly cured, but its disappearance was followed by acute hydrocephalus, from which the child soon died. The writer remarks that, though this might have been merely a coincidence, yet, in view of the family tendency, the treatment had probably been injudicious. Another cause may be observed in a varicose dilatation of the subcutaneous veins, particularly when involving the rectum and lower extremities; the impeded circulation is quickly followed by serous exudation, the activity of the capillaries and lymphatics is arrested, the effete elements are retained, and these combined conditions excite an eruption upon these parts, which is very difficult either to relieve or cure. The appearance of eczema about the anus, perineum, and lower limbs can very often be traced directly to a diseased state of the veins in these regions. In a similar manner a change in the character of the blood, either through the circulation of certain abnormal products, as bile, pus, and drugs, or from the effects of pregnancy, lactation, malaria, anemia, fevers, vaccination, wounds, improper hygienic surroundings, and other causes, by which the life-current is depleted or vitiated, may lead to an eczema. Diabetes mellitus and Bright's disease are frequently attended by eczema.

On the other hand, acute nephritis occasionally develops during the course of an eczema. Several cases of this kind have been reported during the last few years. Dr. C. Bruhns, of Leipsic, describes seven cases in which this complication occurred, and in all the kidney trouble may be regarded, either with certainty or a high degree of probability, as having been caused by the eczema. Similar cases, some of which proved fatal, are placed upon record by Canali, Regoli, Felici, and Caloni. Eczema sometimes alternates with attacks of asthma or bronchitis. It often takes its origin in the various disorders of the gastro-intestinal canal. Dyspepsia is, perhaps, the most common, with its long chain of symptoms. Patients so affected will usually be attacked about the face, hands and arms. Another of the same class of causes is dentition, which occasionally sets up an irritation of the mucous membrane, which, becoming reflected, disturbs digestion, no doubt produces some pernicious effect on the nervous system, and thus develops and augments the disease. The examination of the gums in these cases will show the mucous membrane to be intensely congested, hot, and tumefied, attended with evidence of a derangement of the gastro-intestinal canal; the free use of the lancet to the parts will soon allay all irritation, relieve the imperfect digestion, lessen the eruption, and settle conclusively the cause of the appearance of the eczema. Intestinal worms, hemorrhoids, and fistula in ano are also other instances of disorders of the gastro-intestinal canal that may give rise to eczema either by their reflected irritation or by the tone and vigor of the system becoming lowered by their presence. Eczema is likewise generated through many derangements of the nervous system. It is in this way that neuralgias, nervous debility, exhaustion, shock, excesses of all kinds, and only way, therefore, of distinguishing scabies from eczema, or detecting the exciting cause is by the history of contagion and the locality affected. The contagiousness of the disease, and its attacking by preference certain regions, as the fingers, hands, anterior surface of the arm, and axillæ in both sexes, the breast and nipple in the female, the penis in the male, and the buttocks in children, are strong proofs against the eruption being primarily eczema. Sometimes even these valuable indications fail, from an inability to glean any history of contagion, and the part or parts involved may be in such a high state of inflammation, from scratching and applications, as entirely to mask all the evidence of the true nature of the disease. In that event the diagnosis will depend upon the results of treatment. The use of antiparasitics will lessen the irritation and afford relief if it be scabies, but if it be eczema there will be no change, but rather an aggravation of the eruption. In a person predisposed to eczema scabies may give rise to a genuine attack of the former affection.

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TRICHOPHYTOSIS.—Ringworm, in various parts of the body, may simulate eczema, or it may, by scratching and applications, occasion, at the same time, an eczematous eruption. Ringworm of the scalp is distinguished from eczema by the history of contagion; the diseased surface has a dirty, scaly, deadened, circular appearance, the outlines of the patches being sometimes erased in severe and chronic cases, and the hairs lack lustre, are split up, and broken off. Ringworm of the beard is similar in appearance to that of the scalp with often more inflammatory action; the patches tend to clear in the centre; their borders are also somewhat elevated, scaly, and slowly creep from point to point; the hairs become loose; occasionally the surface is covered with papules, pustules, tubercles, and assumes a boggy condition. In eczema of the scalp there is usually moisture; scales, if present, are of a light color, covering a surface that is red, often infiltrated; the diseased patches are not so well defined, and the hairs are usually unaffected. When eczema attacks the beard, there is no tendency to spread in the manner just cited, or for the affection to disappear in the centre; the hairs are usually unchanged, and the inflammatory action is not so severe as in ringworm. All doubt can finally be set at rest by removing some of the scales or hairs, placing them beneath the microscope, and ascertaining the presence or absence of the fungus of ringworm.

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LUPUS.—Lupus vulgaris can at all times be differentiated from eczema by its chronic and destructive course; the red, glazed, and scaly patch having soft, gelatinous tubercles around the border of the diseased surface. Lupus erythematosus may bear even a stronger resemblance to erythematous eczema, but the history, the firm attachment of the scales to the surface, the involvement of the sebaceous glands, and the absence of itching, are sufficient to distinguish it from the latter disease.

PEDICULOSIS CAPITIS ET CORPORIS.—Lice on the head or body will excite lesions which closely resemble eczema, and often give rise to an eczematous eruption, but the detection of the pediculi and their nits is all that is necessary to complete the diagnosis. Pediculosis may also occur on the scalp as a secondary complication of eczema, and in such cases the eruption may extend beyond these parts to the neck and face, or it may be seen on other portions of the body. Pediculosis corporis causes abrasions of the integument very much like eczema; the presence of

**Treatment.**—In considering the treatment of the most frequent, obstinate, and at the same time most curable affection of the skin, the management of the standard varieties, and their secondary changes, will first be discussed; after which the eruption, as it occurs in the infant and upon the different regions of the body will receive special consideration. In entering upon the treatment of the disease two important indications are always necessary: first, the detection and removal, if possible, of the exciting cause, and all sources of irritation; and, secondly, the modification or cure of the morbid condition of the skin. In regard to the first, it is obvious that while the disease may be modified, yet it will often be impossible to effect a permanent cure as long as the exciting cause or any source of irritation exists. Thus, in eczema from gout or rheumatism it would be useless to expect a cure as long as the elements of these affections remain in the body. The eruption may for a time disappear, but a relapse is liable to occur sooner or later, until the original disorder has been eradicated. It will not always follow, on the other hand, that with the removal of the exciting cause the eczema will at once subside; the alteration in the skin may be so decided as to require in addition a patient and tedious course of treatment. The factors which frequently play an active part in producing or aggravating the disease may be improper internal or external medication, or any of the numerous sources of external irritation. Many of the so-called tetter specifics, or blood-purifiers, really increase or prolong the eruption, until the patient is compelled by necessity to seek the physician's aid. Again, many of such preparations as Fowler's or Donovan's solutions, and the iodides, which to those well informed are valuable drugs, become in the hands of the ignorant often the most injurious. In truth, these and other remedies may be useful at one stage of the disease and injurious at another, and therefore, when taken by patients upon their own responsibility, will very often aggravate the eruption. It is well, therefore, in the majority of cases, particularly if the physician suspects that the patient has been self-treated, or that the eruption has increased under the administration of the internal or external medication, or both combined, to discontinue, or give an expectant treatment, and watch the result. Again and again have I—as well, no doubt, as many others—seen the eruption disappear under such circumstances without the least interference upon the part of the physician. External medication alone, which has just been mentioned, may in a like manner, either from application of improper or too strong agents, such as the various tetter-ointments, or from the use of stimulating remedies at the wrong stage of the disease, produce the most harmful results. Scratching, rubbing, and tearing the skin are also injurious, and in this respect patients must either exercise some restraint or be restrained. In like manner the wearing of flannel and dyed goods in contact with the inflamed skin and the excessive application of water with or without soap are often fruitful sources of irritation, which must be removed before improvement can be secured.

All atmospheric changes, and other means of irritation that prove harmful, should also at once be remedied. Lastly, the parts involved should, if necessary, be placed at rest. Every organ is universally admitted to need rest when disordered except the skin; and this important part of the economy may become inflamed, and yet patients continue in their active duties, expecting a cure to be effected by internal and external medication alone. Is it reasonable to suppose, for instance, that eczema of the hands can be easily relieved or cured while the patient is pursuing the occupation that originally gave rise to the disease? Can the genital organs, when inflamed, recover their healthy state while subjected to the irritation excited by the friction of the clothes in walking? Can the legs respond well to treatment while the sufferer constantly stands or walks upon them? The answer is, that these cases imperatively need or demand rest. Rest is not only a benefit at certain periods of eczema, but it is also sometimes an essential element in the ultimate cure of the disease. Yet, while it is an element of much good at certain times of this disease, at others it is also harmful, and should be enforced only when necessary, and then neither too rigidly nor too long in duration. Remember that the opposite state of rest, motion or activity, unless contra-indicated, is productive of benefit to the skin, as well as all the organs of the body.

The second indication in the treatment of eczema is to modify or cure the morbid action of the skin by the employment of either internal or constitutional remedies that may affect the cause of the disease, or by the use of local means that act upon the diseased surface. In some, internal medication may be all that is necessary, while in others local remedies may alone act efficiently. Experience has led me, however, to view eczema as being dependent upon systemic disturbance, and therefore in the majority of cases I usually recommend both internal and local treatment.

CONSTITUTIONAL TREATMENT.—Abundant evidence has shown that most cases of eczema are benefited by the use of general treatment. Cases appear, however, where local measures alone will suffice. The distinction should be made after a judicious and careful examination, and the case managed accordingly. When general treatment is demanded, it should be instituted as soon as possible, and continued without interruption until the purpose for which it was intended has been entirely fulfilled. In the first place, diet and hygiene are both more or less essential in the general management of eczema. In reference to diet, it is important that it should always be suitable to each case, whether it be the acute or chronic form. Thus, certain individuals, particularly those that are plethoric or dyspeptic, will often require a restricted or mild diet, while others will demand the most nutritious food. Certain substances, however, will, in most cases, be found injurious to the patient. Among these may be mentioned strong coffee or tea, alcoholic fluids, pork, cheese, and shell-fish. Where idiosyncrasy is discovered regarding certain articles of food, this fact becomes an important indication in the dietetic treatment.

Hygienic measures are very important; proper rest, sleep, bathing, suitable clothing, and ventilation, good air, sunshine, and regular exercise, walking, riding, and massage, unless contra-indicated, will often be of the greatest assistance in the treatment. Nursing is also of the utmost value, particularly in young children and old persons. Preparing and administering properly the food and medicine are equally essential to many of these patients at both periods of life, no less than are the carrying out suitable hygienic measures and making the local applications in the manner in which they are required.

Generally the treatment should be commenced by correcting any abnormal condition of the secretions; cathartics and diuretics are usually of service, particularly in the acute variety. The moderate unloading of the bowels by a purgative or laxative prepares the system for the more successful action of other remedies. They also—with agents that promote the action of the kidneys—lessen the cutaneous congestion, and thus afford much relief. Blue mass or calomel, with or without some additional cathartic, will often answer the purpose. Calomel and sodium bicarbonate in powder form, are much used, in small doses as a mild purgative. Eupatorium is recommended also for this purpose by Piffard, who gives the fluid extract in doses of thirty minims night and morning. Sometimes a saline aperient alone, or following the mercurial, will be most suitable. Cream of tartar, Epsom, Rochelle, and the various aperient salts, with or without iron or a bitter tonic, are all valuable. The following combination can be employed with advantage:

| | | | |
|---|---|---|---|
| ℞ | Magnesii sulphatis ................. | ʒv. | 20. |
| | Ferri sulphatis ..................... | gr. x. | 0.60 |
| | Acidi sulphurici dil. ................ | fʒss. | 2. |
| | Tinct. cardamom .................. | f℥j. | 32. |
| | Infus. coptis trifoliæ .......q. s. ad ft. | f℥v. | 160. |

M. Sig.: A tablespoonful in a wineglassful of water two or three times daily. The quantity of the magnesia and iron can be increased or decreased, according to the requirement in each case. Quinine and strychnine may be added if desired.

The saline and alkaline purgative waters of Saratoga, Epsom, Kissingen, Carlsbad, and Friedrichshall also are of service.

In cases characterized by marked constitutional excitement, the skin being inflamed, often hot, and very irritable, moderate blood-letting will unload the capillaries and allay the active symptoms. Again, tartar-emetic, aconite, ipecacuanha, veratrum viride, gelsemium, strophanthus, and digitalis are all valuable remedies, given in small doses, alone or with neutral mixture, or spirit of Mindererus, to relax the skin and produce a prompt and beneficial effect upon the eruption. The kidneys may be rendered active by the above means, especially if the skin is very inactive, or by the use of such alkalies as potassium or sodium acetate, in doses of from ten to twenty grains (0.60 to 1.30 gm.) in water, or combined with sweet spirit of nitre or infusion of digitalis. The benzoate of lithia, in doses of three to five grains (0.18 to 0.30 gm.) in water before meals, answers a very good purpose. The diet should be light, especially in the acute form, and any alimentary derangement corrected according to the indication present—one may need pepsin, bitters, or mineral acids, and another alkalies or one of the silver salts.

Imperfect assimilation, and the various disorders which it gives rise to, may be corrected by an occasional blue pill, followed by a saline, together with the toning up of the digestive organs. If the patient possesses a rheumatic or gouty diathesis, diaphoretics, diuretics, and alkalines are of advantage, with or without aperients. Thus, the potassium or sodium acetates, in from ten to twenty grains (0.60 to 1.30 gm.), three to six times daily, are often useful in rheumatic patients. Salicylic acid, sodium salicylate, the oil of gaultheria, salol, the lithia salts, and the alkaline natural spring waters, alone or combined, and especially salicin, will prove of advantage in both rheumatic and gouty subjects. The following will be found of service in the latter class of patients:

| | | | |
|---|---|---|---|
| ℞ | Extracti colchici acet. | gr. viij. | 0.50 |
| | Extracti digitalis | gr. iv. | 0.25 |
| | Extracti colocynthidis co. | gr. xvj. | 1. |
| | Quininæ sulphatis | gr. viij. | 0.50 |

M. Ft. pil. No. xvj. Sig.: One pill three or four times a day.

The benzoate of sodium, also, is beneficial in cases dependent upon rheumatism, while in eczema associated with gout the benzoate of lithium is of service. In the violent attacks of eczema to which rheumatic and gouty individuals are occasionally liable, Brocq is accustomed to begin the treatment by the administration of large doses of quinine as soon as the premonitory symptoms are manifested. Strychnine, codliver oil, malt, and the various bitter tonics are beneficial in those who are debilitated or present evidence of imperfect nutrition. Iron in the form of one of the salts, tinctures, wines, or syrups, or any of the chalybeate waters, by its tonic action upon the system renders most efficient service in eczematous subjects, particularly in those who are anemic. Cascara amarga has been thought to possess tonic and alterative virtues. The syrups of the phosphates and the hypophosphites are also valuable. In the eczema of aged people, in whom the disease usually assumes a chronic form, quinine,

as Bulkley points out,[1] is of special service, both on account of the ma
taint often at the bottom of the trouble and as a pure tonic. In the
class of patients a hypnotic is often required, and among these phena
in five-grain (0.30 gm.) doses at bed-time are recommended. A
should usually be forbidden, though if the patient has been accust
to its use, a regulated quantity may be allowed with the meals. Te
coffee may be taken in moderation and an ordinary mixed diet perm
though it should be remembered that aged people require less suste
than those in the prime of life.

Arsenic is a powerful and valuable agent in eczema, but its
criminate use is often followed by injurious results. It should not u
be employed in the acute stage, as it very often aggravates the eru
It is especially indicated in the chronic form, alone or combined with
and other preparations, and is equally efficacious in nervous case
those that are accompanied by malaria. It is not usually prescrib
digestive disorders exist, but even in such cases in very small doses
or two drops, before meals, the result from its use is often most gratif
In administering arsenic I usually prefer arsenic trioxide or so
arsenate, for the reasons already stated, and the drug should be conti
for a time after all eruption has disappeared. The following p
frequently use in chronic eczema with benefit:

| | | |
|---|---|---|
| ℞ Extracti calami | gr. xxx. | 2. |
| Extracti digitalis | gr. v. | 0.30 |
| Sodii arsenatis | gr. j. | 0.06 |
| Extracti nucis vomicæ | gr. ij. | 0.12 |

M. Ft. pil. No. xxx. Sig.: One pill three times a day.

Warburg's tincture is of service, when eczema is associated w
malaria. Where arsenic will not be well tolerated by the stomach, it
be used by the rectum in suppository, or hypodermically. One-eighth
one-quarter of a grain (0.008 to 0.015 gm.) of arsenic trioxide, or sodi
arsenate, may be given by the former method twice a day. In injecti
either of the preparations just mentioned into the subcutaneous or mus
lar tissue, from one-twentieth to one-half of a grain (0.003 to 0.03 g
may be administered once a day. I have often built up old eczemat
cases by tonics and good, nutritious food, and at the same time brou
the system thoroughly under the influence of arsenic by injecting
beneath the skin. In some old cases of eczema, Klotz has obtained v
satisfactory results from the daily hypodermic injection of ten to fift
drops of a one-per-cent. solution of pilocarpine hydrochloride. Nerv
subjects often require, in addition, the preparations of phosphorus,

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[1] "On the Treatment of Eczema in Elderly People." By L. Duncan Bulk
A.M., M.D. Reprinted from Transactions of the New York State Medical Soci
1890.

use of electricity, or a complete change of air and scene. The mercurial salts, especially the corrosive sublimate, in very small doses, are often followed by successful results. Viola tricolor has long been employed by French practitioners with good effect, and also by Piffard, who recommends one or two drachms (4 to 8 gm.) of the herb with a half-pint to one pint (256 to 512 gm.) of hot water, to be made into a tea and taken in twenty-four hours, alone or combined with senna. He also uses the fluid extract of the drug in five- to ten-drop doses, once, twice, or three times daily before meals. Tar and sulphur have been used with advantage in chronic cases; the former can be given in the form of pix liquida, in from one to six grains (0.06 to 0.36 gm.), three times daily, and the latter as milk of sulphur, or, what is even better, by drinking some one of the sulphur-spring waters that exist so abundantly throughout this country. Besnier regards sulphur, in small doses, as particularly beneficial in young anemic, lymphatic, or tuberculous patients. Calcium sulphide, in from one-thirtieth to one-grain (0.002 to 0.06 gm.) doses three or four times daily will prove of service in both acute and chronic eczema. It is particularly useful in the pustular variety, often lessening rapidly the tendency to the formation of pus. Potassium chlorate has an analogous action, in from one- to ten-grain (0.06 to 0.60 gm.) doses, several times daily. Valuable properties have also been attributed to the internal use of chloride of calcium. Small doses of antimony or antimonial wine are often beneficial, especially in the chronic form. Further, the derangement of the system, or any of its organs, must always be considered, and treated accordingly. For instance, those possessing a predisposition to the development of eczema, inheriting a weak skin, or having what is known as the scrofulous diathesis, are successfully treated with a good nutritious diet, bathing, fresh air and plenty of outdoor exercise, massage, codliver oil, and malt. The ferruginous preparations, potassium chlorate, quinine, strychnine and sometimes arsenic, may be indicated. A combination of wine of iron and Pearson's solution, as in Wilson's ferro-arsenical mixture, often yields good results in scrofulous subjects. Preparations of iodine and sulphur may also be advantageously prescribed, or may be given together in the form of the iodide of sulphur. Again, a change of climate will often exert a most decided influence in assisting to overcome the general debility of this unfortunate class of sufferers. In squamous eczema, Jamieson has witnessed decided improvement follow the hypodermic injection, twice daily, of one-sixth to one-third grain (0.01 to 0.02 gm.) of pilocarpine.

Itching, burning, or pain often becomes so distressing as to call for the administration of suitable constitutional remedies. Besnier advises that when pruritus is present the patient should be restricted to a milk diet until the case has been thoroughly studied. Opium or morphine are of service in some cases, but entirely fail in others. Belladonna or hyoscyamus, pushed to full doses, at times act with good effect. Paraldehyde, chloral, and the bromides, especially the two latter in combination, often act effectually. I very often resort, in cases of great irritability of the skin, especially when there is disorder of the alimentary canal, to the use of suppositories containing one or more of the drugs just named.

℞ Extracti opii,
Extracti belladonnæ,
Extracti hyoscyami ................ āā gr. iv. 0.25
Olei theobromæ .................. q. s.

M. Ft. suppositoria xij. Sig.: Insert one into the rectum every two or three hours or until relieved.

In case the opium will not agree with the patient, but aggravates the eruption, it can be replaced by adding five or ten grains (0.30 or 0.60 gm.) of chloral to each suppository. Chloral is valuable used in this way, particularly in infants and children, the dose being from one to five grains (0.06 to 0.30 gm.) in each suppository. Bulkley recommends the tincture of gelsemium for the itching, beginning with ten-drop doses, to be gradually increased every half hour until the patient is relieved, or has experienced some of the physiological effects of the drug. The antispasmodic remedies, as valerian, asafetida, castor, or musk, are also to be recommended for the purpose of allaying itching and nervous excitement. They are administered in the form of injections or suppositories. Phenol and salicylate of sodium are given internally in appropriate doses for the relief of the same symptoms. Antipyrin sometimes succeeds in relieving itching. Cypripedium is occasionally used with advantage for the same purpose; and urethan may afford relief when administered in doses of twenty to forty grains (1.30 to 2.40 gm.), repeated at two-hour intervals until two or three doses have been taken. Rectified oil of turpentine in ten-minim doses, thrice daily, gradually increasing to twenty or thirty minims, is, according to Crocker, useful in rebellious cases. Favorable reports have been made concerning the use of the thyroid gland or its extract in chronic eczema. Cases have been reported by Byron Bramwell and Arthur T. Davies. In a later communication upon thyroid feeding Zum Busch gives his results in twelve cases, of which nine were cured and two improved, while in one case the disease was aggravated under the treatment.

**Local Treatment.**—While constitutional treatment alone may frequently cure, yet the addition of judicious external applications will, in most cases, be of advantage. If no sufficient evidence exists for general treatment, owing to the cause having disappeared, attention should be directed to the local measures alone. Viewing the disease as being dependent upon constitutional impairment, I generally employ both methods, unless reasons indicate its purely local nature. The local treatment, whether used in conjunction with general measures or alone, is of the utmost importance. The first step to be considered is the history and the symptoms. Inquiry will reveal the condition of the skin, whether naturally weak, sensitive, or healthy before the outbreak of the eruption. The duration of the disease, if a first attack or a relapse, and the region and extent of surface involved, will be shown. A careful examination will point out the condition of the affected skin, the presence of few or many primary or secondary lesions, and whether the disease is active, passive, or on the decline. Having discovered the stage and variety of the disease, as well as any peculiarities that the skin may possess, external treatment can be carried out usually in the most satisfactory manner. If these precautions be neglected, unsuitable applications are liable to be made, with injurious effects. For example, the treatment which is appropriate for one stage is often unsuited for another; the means employed for the acute are ineffective in the chronic; and, in like manner, that which is effective in the chronic is usually irritating or harmful in the acute.

The next indication in the local treatment is the removal of any hairs, secondary products, or foreign material, which have collected upon the part, in order that the desired application can be made directly upon the unhealthy surface. Too often this is neglected; the poured-out products are allowed to remain or are but partially removed, or the applications are dusted or smeared on from time to time without once cleansing the surface. The diseased parts are then not at all medicated, and the foreign elements irritate and still more aggravate the eruption. Patients and nurses must be impressed with the necessity of cleansing the surface and exposing the disease according to the method thought best by the attending physician. The method generally employed to loosen and remove scales, crusts, and any extraneous matter is the use of oils, fats, water-dressings, or water and soap. The surface to be cleansed is generally saturated with an oily preparation, and the crusts, scales, or other foreign material that may be present disappear after one or more applications, and in case of much difficulty the addition of water and soap brings about the desired result.

ACUTE AND SUBACUTE ECZEMA.—The principle of local treatment in both the acute and subacute stages of eczema, after cleansing the diseased surface, is the employment of means to protect, soothe, and sometimes produce a mild astringent and stimulating effect, in order to modify and relieve the inflammatory symptoms. Certain precautions should, however, be considered in using local applications. The skins of all persons are not alike; some are more sensitive than others, and therefore agents which are beneficial to one will often prove harmful to another. Remedies that are indicated may be used cautiously upon a part, and not to the entire surface at once, and if the effect is good, it can be made general, and should be persisted in as long as the result is beneficial. If the application should fail, or excite and aggravate the inflammatory symptoms, others should be used; and in case all means do more harm than good, then all active treatment must be discontinued and the expectant method adopted. It is also well to bear in mind, and particularly to caution patients, that acute eczema is frequently irritated by both air and water, especially soap and water. The applications usually employed in acute eczema are lotions, medicated dusting-powders, and fatty and oleaginous substances. If one is not suitable to the surface, another, or a combination, may be.

*Water.*—Water is an element which is much abused in the toilet of eczematous patients, and often aggravates acute cases; if used in moderation it will agree with some, but, on the contrary, not with others, and, of course, it should not be hard, but should be made soft by some mucilaginous substance in it. Water, alone or medicated, can be employed both to cleanse an eczematous surface and to allay the inflammatory symptoms. It can be used at all temperatures, and medicated with many remedial substances. Water, applied in the form of hot or cold fomentations or by sponging, often relieves inflammatory actions and allays local irritation. The combination of water and a fatty substance is also of service; the inflamed skin, after being anointed with some fat, should be immersed in a water-bath at the temperature of the blood. Medicated water, in baths and lotions, is a most agreeable form of treatment for acute eczema. The emollient and alkaline baths, or both combined, are perhaps the most valuable of medicated waters, and prove most grateful in alleviating the hot, tense, and itching condition. Baths containing bran or starch often afford decided relief, though bran will sometimes aggravate the condition. In certain cases chamomile water proves beneficial. The peroxide of hydrogen is valuable. It will frequently be too strong unless diluted with several parts of water, or the water may be medicated and used in the form of a lotion. Lead-water and laudanum, two ounces (64 gm.) of each to a pint (512 gm.) of water, will at times be very beneficial. Lime-water, glycerine, and water, in equal parts, form an acceptable application. After the initiatory manifestations have somewhat subsided the glycerite of tannin serves a useful purpose, applied twice during the day. Boric acid, borax, sodium bicarbonate, sodium sulphite, or sodium hyposulphite, one to two drachms (4 to 8 gm.) of either to a pint (512 gm.) of water, are valuable lotions. I frequently employ two to four drachms (8 to 16 gm.) each of powdered alum and borax, in three to four pints (1,536 to 2,048 gm.) of hot water, applied with old pieces of muslin. In using lotions care should be taken not to place too much material in contact with the part. The substance used should be thin, permitting free evaporation, otherwise it may act as a poultice and aggravate the inflammatory symptoms. A diluted fluid extract of hamamelis or

grindelia robusta has been used with success. I have also employed with benefit in vesico-papular and papular eczema, phenol, a drachm (4 gm.) to the pint of water. A saturated solution of picric acid is highly esteemed, the surface being painted with the fluid and covered with a compress moistened with the same solution. Tilbury Fox recommended the following application: An ounce (32 gm.) of fine levigated calamine, two drachms (8 gm.) of glycerin, half an ounce (16 gm.) of oxide of zinc, and six ounces (192 gm.) of water—to be well shaken, and sponged frequently on the part. The sediment which is deposited on the skin should be allowed to remain, as it excludes the air from the inflamed surface. An equally serviceable lotion is composed of zinc oxide four drachms (16 gm.), glycerin one ounce (32 gm.), rose-water two ounces (64 gm.), lime-water three ounces (96 gm.). To make it more sedative a drachm (4 gm.) of spirit of camphor, or six drachms (24 gm.) of laudanum, may be added. If stimulation is required, as in the circumscribed papular variety, ten or fifteen grains (0.60 to 1 gm.) of thymol, or a drachm (4 gm.) of either liquor picis alkalinus or liquor carbonis detergens can be added. Black-wash and yellow-wash are valuable in the acute papular variety, fulfilling the indications mentioned—protection with moderate stimulation. H. Lyle, of Liverpool Hospital for Cancer and Skin Diseases, uses a solution of bichloride of mercury in every case of weeping eczema. He applies it on lint and invariably the skin becomes dry in a very few days, and other ointments or lotions may be substituted. When the disease is attended by excessive itching, lotions containing phenol or chloral are service-
by excessive itching, lotions containing phenol or chloral are serviceable.

In using water alone or medicated it will often be of the utmost benefit, immediately after mopping the parts, to apply one of the dusting-powders, while the surface is yet moist, in order to exclude the air from the sensitive skin.

N. E. Aronstam, in "Central States Medical Monitor," states that the solution of the active principles of the adrenals, about 1 to 1,500 or 1,000 is a very powerful astringent and soothing agent in acute eczematous conditions. It allays the subjective symptoms, blanches the part by virtue of its astringent property without secondary dilatation of the capillaries. It is well to reinforce its action by the addition of some boric acid and camphor water in the following proportions:

| | | | |
|---|---|---|---|
| ℞ | Acidi boracici ........................ | gr. v. | .32 |
| | Liquoris adrenalini (1:1,000) ......... | fʒj. | 4. |
| | Aquæ camphoræ ...................... | fʒij. | 8. |
| | Aquæ des. .....................q. s. ad. | f℥j. | 30. |

M. et Sig.: Saturate a piece of sterile gauze with this solution and apply to the inflamed or affected parts; renew the application when the dressing is dry.

*Dusting-powders* are most beneficial when the surface is more
covered with redness, vesiculation, papulation, pustulation, or a
exudation. They may be either perfectly bland and soothing, or th
have some astringent, sedative, or other remedial action. Amon
that may be employed are starch, arrow-root, rice, buckwheat, lycop
talc or French chalk, magnesium carbonate, zinc oxide, pure and i
zinc carbonate and oleate, bismuth subnitrate, and lead carbonate
most emollient and soothing are the first three; the magnesium
bismuth, and lead are astringent as well as sedative. Boric acid i
wise a good antiseptic dressing, and may be employed or mixed wit
one or other of the above-mentioned substances. One or more of
remedies can be combined with other medicinal agents with adva
For protection and for soothing I generally employ equal parts of
root and rice-powder, and, if there is much itching and burnin
addition of a little camphor and morphine will be of service. T
of stramomium, hyoscyamus, or cannabis indica, after the metho
posed by Dr. Faithful, aids the soothing effect of the afore-men
remedies. Finely powdered carbonate of calcium is a drug which m
advantageously employed. When a mild astringent action is indica
drachm or two (4 or 8 gm.) of powdered zinc oleate to one-half to an
(16 to 32 gm.) of powdered arrow-root is of utility. The foll
combinations have also been found beneficial:

| | | | | |
|---|---|---|---|---|
| ℞ | Pulv. marantæ | ℥j. | 32. | |
| | Pulv. zinci oleatis | ʒij. | 8. | |
| | Pulv. camphoræ | ʒss. | 2. | M. |

| | | | | |
|---|---|---|---|---|
| ℞ | Bismuthi subnitratis | ʒij. | 8. | |
| | Pulv. amyli | ʒvij. | 28. | |
| | Morphinæ acetatis | gr. j. | 0.06 | M. |

Pyoktanin mixed with talc in the proportion of two per cen
been successfully employed. Dusting-powders may be used with
tage, after the application of fatty and oleaginous substances and
to protect the surface and retain the medicaments upon the
Powder-bags have been introduced by Unna as particularly suitable
treatment of eczema of the scrotum and penis, the groin, und
mammary gland, or in other situations where opposing surfaces
come in contact. They are made of thin cambric or muslin, quilted
so that the powder can not shift from one to the other end. The
is expelled from the bag by movements of the body or part.

Anderson recommends, as a good application in acute eczema,
potato-starch poultice, with some absorbent powder sprinkled o
surface.

*Ointments* are much better adapted for many cases than
powders or lotions. They may be simple or medicated. They

service not only in removing scales, crusts, and other products of eczema, but they also protect and act remedially upon the inflamed surface. It is essential that they should be free from rancidity and well prepared. They should be carefully smeared over the inflamed surface, and, if possible, kept at all times in contact with it, thus excluding the air and preventing the formation of crusts. This purpose can be accomplished by spreading an ointment upon muslin, lint, or cotton, and applying to the parts, or by saturating the surface with oil and using a light cloth or bandage over it. The salve or plaster muslins devised by Unna are of service in maintaining the chosen medicament in continuous contact with the diseased surface. They are made of muslin the meshes of which are filled with rather stiff ointment, and a variety of different drugs suitable to the treatment of eczema and other diseases of the skin have been put up in this manner. The dressing should be changed two, three, or more times daily, according to the indications in each case, and the pent-up secretions permitted to escape; otherwise they may give rise to considerable irritation. If the successive layers harden into a firm coat and act as an irritant to the diseased surface, they must be removed by some appropriate oily substance. The best of the soothing ointments are the zinc oxide or carbonate, one drachm (4 gm.) to the ounce (32 gm.) of cold cream; and bismuth oxide or subnitrate or lead carbonate, one drachm (4 gm.) to an ounce ( 32 gm.) of lard.

Cold cream, also cucumber-ointment, alone or combined with a drachm or two (4 to 8 gm.) of arrow-root, is bland and useful. The ointments of bismuth, lead, and zinc oleate are serviceable in many acute cases. Diachylon-ointment, which is a valuable soothing application, is prepared as follows:

| | | |
|---|---|---|
| ℞ Olei olivæ opt. | f℥xv. | 480. |
| Plumbi oxidi (litharge) | ℥iij, ʒij. | 104. |
| Coque, dein adde | | |
| Olei lavanduli florum | fʒij. | 8. |
| M. Ft. unguentum.[1] | | |

This ointment, which is yellowish in color and of the consistence of butter, is substantially an oleate of lead, and can be applied to any part of the body, except where covered with hair, on which it is unsuitable, on account of its tendency to mat the hair, and thus to prevent its absorption by the skin. A weak ointment of aluminium oleate or iron oleate and likewise of bismuth oleate are also useful applications in acute eczema.

---

[1] The following are the details of its preparation: "The olive-oil should be first mixed with two pounds of water and heated; then, while fresh water is constantly poured in and the mixture stirred, freshly sifted litharge should be gradually added. The whole should be kept in motion until cooled, and, lastly, the lavender-oil should be added. In cold weather an extra ounce of olive-oil should be allowed for every pound of the ointment." Hebra on "Diseases of the Skin," vol. ii, New Sydenham Society, London, 1868.

The following combination, suggested by McCall Anderson, is very effective in many cases:

| | | | | |
|---|---|---|---|---|
| ℞ | Pulv. camphoræ | ʒss. | 2. | |
| | Pulv. zinci oxidi | ʒij. | 8. | |
| | Glycerini | fʒij. | 8. | |
| | Adipis benzoinati | ℥j. | 32. | |
| | Cocci | gr. j. | 0.06 | |
| | Olei rosæ | ♏ j. | 0.06 | M. |

The ointments that I frequently use are:

| | | | |
|---|---|---|---|
| ℞ | Pulv. marantæ | ʒj. | 4. |
| | Plumbi carbonatis | ʒj. | 4. |
| | Cerati galeni | ℥j. | 32. |

M. Ft. ung.

| | | | |
|---|---|---|---|
| ℞ | Zinci carbonatis | ʒj. | 4. |
| | Bismuth subnitratis | ʒj. | 4. |
| | Olei anthemidis | ♏ x. | 0.60 |
| | Ungt. aquæ rosæ | ℥j. | 32. |

M. Ft. ung.

| | | | |
|---|---|---|---|
| ℞ | Hydrarg. chlorid. mit. | gr. x. | 0.60 |
| | Pulv. amyli | ʒj. | 4. |
| | Pulv. camphoræ | ℈j. | 1.30 |
| | Pulv. zinci oxidi | ʒj. | 4. |
| | Adipis benzoinati | ℥j. | 32. |

M. Ft. ung.

| | | | |
|---|---|---|---|
| ℞ | Ung. zinci oleatis | ℥j. | 32. |
| | Extracti opii, | | |
| | Extracti belladonnæ foliorum | āā gr. v. | 0.30 |

M. Ft. ung.

An acceptable sedative and astringent application is:

| | | | |
|---|---|---|---|
| ℞ | Ung. plumbi oleatis | ℥ss. | 16. |
| | Pulv. marantæ | ʒss. | 2. |
| | Olei anthemidis | ♏ v. | 0.30 |

M. Ft. ung.

The following is especially of service in papular eczema:

| | | | |
|---|---|---|---|
| ℞ | Ung. bismuthi oleatis | ℥ss. | 16. |
| | Pulv. camphoræ | gr. x. | 0.60 |
| | Pulv. amyli | ʒj. | 4. |
| | Morphinæ acetatis | gr. j. | 0.06 |

M. Ft. ung.

An ointment of aconite, eight grains (0.5 gm.) to the ounce (32 gm.), is useful in papular eczema, but care is needed in its application to avoid bringing it in contact with any absorbing surface. Chloral hydrate, in the proportion of twenty to thirty grains (1.30 to 2 gm.) to the ounce (32 gm.), may also be serviceably made into an ointment in order to relieve itching. It is very well combined with an equal quantity of camphor. A solution of chloral (five per cent.) is sometimes efficient; it is antiseptic and promotes healing of raw surfaces.

*Oils* are even more grateful than ointments in some cases of eczema. For this purpose any bland oil can be used—*e. g.*, olive, linseed, sweet almond, lard, palm, cotton-seed, and codliver oil—alone or combined with other suitable remedies. Thus equal parts of sweet oil and lime-water are useful. Again, the following will often act well in either the erythematous or vesicular varieties:

| | | |
|---|---|---|
| ℞ Olei olivæ | f℥iv. | 128. |
| Plumbi carbonatis | ʒij. | 8. |
| Zinci carbonatis | ʒij. | 8. |

Another excellent prescription is:

| | | |
|---|---|---|
| ℞ Olei amygdalæ | f℥iv. | 128. |
| Calaminæ | ʒij. | 8. |
| Olei anthemidis | ♏ x. | 0.60 M. |

Pastes have of late years been much employed by Unna and other German physicians in the treatment of eczema. They are made by stiffening an ointment by means of some dry innocuous powder, such as starch, silica, or carbonate of magnesium. Such preparations are held to be superior to ointments, in that they are able to absorb secretions and leave a powder closely attached to the integument, from which it is not easily removed.

CHRONIC ECZEMA.—It is often impossible to decide positively when acute stage ends and the chronic begins. The former, however, is usually of short duration, from several days to a few weeks, to be succeeded frequently by the latter. The secondary changes which then occur, especially the infiltration, require decided measures, to stimulate the action of the absorbents and induce a reabsorption of the exudation.

*Baths.*—Baths become, in this stage, the most effective means not only of removing scales, crusts, and other secondary products, but also of arousing the dormant blood-vessels and lymphatics to renewed activity. While baths will not be suitable in all cases, the irritation and even inflammation occasionally increasing under their use, yet in the majority of chronic eczematous conditions they are most valuable additions to the treatment. Thus the hot-air, electro-vapor, simple and medicated vapor baths assist in relieving the red, infiltrated, rough and scaly conditions of the surface by awaking the sluggish skin to activity, and softening and detaching the scales and crusts, if any are present. The medicated vapors, especially the sulphur, have very often the additional effect of relieving the itching which may exist. The medicated liquids are not only useful in cleansing the surface, but may be made soothing by the addition of starch, bran, and sodium bicarbonate; or stimulating by sulphurous and boric acids; and astringent by alum, tannic, and gallic acids.

*Soaps.*—Soaps may frequently be employed with advantage, not only for the purpose of cleansing the surface of scales, crusts, and all extraneous material, but also for their stimulating or caustic action, and as a convenient method of bringing certain medicinal substances in contact with the skin. Either the soda or potash soap can be employed, alone or combined with other remedies. The best example of the former is the well-known Castile soap, with which can be incorporated sulphur, tar, betanaphthol, one of the mercurials, phenol, boric or salicylic acid, forming special medicated soaps which are valuable in the treatment of chronic eczema. The potash or soft soap (sapo viridis) can be employed as recommended by Hebra until the infiltrated epidermis is softened, macerated, and removed; then with sterilized water wash the surface and apply a suitable ointment, generally the diachylon. The green-soap treatment of chronic eczema is more adapted to localized patches of the disease, and even then the integument of Americans, which is usually very sensitive, will frequently become worse under the use of so harsh a procedure.

Dr. G. H. Fox, of New York, has made use of a soft olive soap which he finds equally effective and a more elegant preparation than the green soap. It is made from cold-pressed olive-oil, has a green color due to the chlorophyll of the olive, is homogeneous, free from unpleasant odor, and forms a perfectly clear solution with strong or dilute alcohol.

*Tar.*—Tar, and some of its products, as phenol or carbolic acid, creosote, betanaphthol, and naphthaline, are among the most valuable external remedies that can be employed in chronic eczema, but they are all contra-indicated in the acute stage, especially if there be much redness, elevation of temperature, swelling, vesiculation, and infiltration. In employing tar and its products, even in the chronic stage, care should be observed that they are diluted properly, and then applied first on a small area of the surface, in order to test their action upon the patient's skin. All individuals do not bear these preparations well, and occasionally a chronic eruption is aggravated by their employment into an acute condition. The forms of tar commonly used are wood-tar (pix liquida), coal-tar (pix mineralis), Burgundy pitch (pix Burgundica), terebinthina Canadensis (balsam of fir), all of which are cheaper, and therefore of more advantage to prescribe in dispensary and hospital practice than the more elegant preparations of oil of cade (oleum cadium) and the oil of white birch (oleum rusci), which are more suitable for private practice. Any of the above can be combined in various proportions with ointments, oils, spirits, and soaps. In whichever form tar is used it should be firmly rubbed into the part with a piece of flannel, one or more times daily, according to the condition of the skin. In some cases it is well to allow the tarry preparation to remain upon the skin until it is naturally cast off, while in others it becomes necessary to cleanse the surface with oil or water and soap. In many instances tar is better borne in the form of an ointment, especially where there is more or less infiltration and a tendency to the development of fissures. The proportion of the tar to the ointment varies with the requirements of each case. One or two drachms (4 to 8 gm.) of the former is generally used to an ounce (32 gm.) of the latter.

| | | |
|---|---|---|
| ℞ Olei cadini | fʒj. | 4. |
| Olei verbenæ | ♏ v. | 0.30 |
| Adipis benzoinati | ℥j. | 32. |

M. Ft. ung.

The above is a useful combination, with or without the addition of zinc oxide or of sublimed sulphur. Zinc and lead ointments, especially the diachylon, and the mercurials, are valuable as vehicles for tar and for the additional remedial action that they exercise upon the skin. Tar may be advantageously combined with olive oil and codliver, and other oils, for use upon the hairy portions of the body. Another excellent method of using it, is in the form of a lotion, especially in regions covered with hair:

| | | |
|---|---|---|
| ℞ Olei rusci | f℥ss. | 16. |
| Olei lavandulæ | fʒj. | 4. |
| Spiritus odoratis | f℥vi. | 192. |

M. Sig.: Rub firmly into the skin.

Tar can also be suspended in alcohol alone, or with the addition of sapo viridis. The tincture of witch-hazel, and spirit of rosemary are also suitable solutions to which tar may be added. Among other valuable preparations of tar, is the tinctura saponis viridis cum pice of Hebra, the compound tincture of green soap:

| | | |
|---|---|---|
| ℞ Olei cadini, | | |
| Saponis viridis, | | |
| Spiritus vini rectificati | āā f℥j. | 32. |
| M. filtra et adde | | |
| Spiritus lavandulæ | fʒij. | 8. |

M. et ft. lotio.

Bulkley recommends the following useful solution, which is miscible in all proportions with water:

| | | | | |
|---|---|---|---|---|
| ℞ | Picis liquidæ | f℥ij. | 64. | |
| | Potassæ causticæ | ℥j. | 32. | |
| | Aquæ destillatæ | f℥v. | 160. | |

M. Dissolve the potash in the water and add slowly to the t a mortar, with friction.

Sig.: Liquor picis alkalinus, to be used diluted.

In circumscribed patches of chronic eczema in old people the writer makes use of a tar ointment:

| | | | | |
|---|---|---|---|---|
| ℞ | Zinci oxidi | ʒj. | 4. | |
| | Ung. picis liq. | ʒiv. | 16. | |
| | Ung. aquæ rosæ | ℥jss. | 48. | M. |

If the thickened tissues do not soften under this application he a quarter-part of diachylon-ointment to the above, and in still obstinate cases, ten to twenty grains (0.60 to 1.30 gm.) of salicylic ac the ounce (32 gm.).

McCall Anderson[1] states that an English pharmacist has disco that by the addition of laminaria saccharina (Sea-Belt) to pix liqui is miscible with hot water in all proportions. Phenol and creosot useful in chronic as well as in acute eczema. They may be emp either as lotions or ointments for their stimulating and anti-pr effect. Phenol, probably the better of the two, can be dissolv water or added to any of the ointments or oils in the proportion o to thirty grains (0.30 to 2 gm.) to the ounce (32 gm.), decidedly enha their value. The compound tincture of benzoin, or a solution of b acid in cologne water, is often useful in relieving the itching. Ca is another remedy which is employed for the same purpose, and m effectively combined as follows:

| | | | | |
|---|---|---|---|---|
| ℞ | Camphoræ | gr. x. | 0.60 | |
| | Sulphur sublimat. | ʒss. | 2. | |
| | Ol. eucalypti | ♏ x. | 0.60 | |
| | Creosoti | ♏ viij. | 0.50 | |
| | Ungt. aquæ rosæ,<br>Ungt. zinci oxidi | āā ℥ss. | 16. | M. |

A five-per-cent. solution of chloral will likewise alleviate this sym as will also a lotion or ointment containing cocaine.

Betanaphthol[2] and naphthaline have been used as substitutes f tarry preparations in the treatment of chronic eczema. Of thos remedies the more useful and effective is betanaphthol.[3] It has a d action upon the skin, and obtunds the sensibility of the cutaneous nerves. It is a serviceable remedy in rough, infiltrated, and irritable conditions of the integument, stimulating the absorbents, and at the same time is one of the very best anti-pruritic agents. I frequently employ:

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[1] *Loc. cit.*

[2] See paper on "Naphthol," by the author, Transactions of the Phila County Medical Society, 1883.

[3] See paper by the author on the "Treatment of Skin Diseases by Nov and Methods," Transactions of the International Medical Congress, Copenhag mark, 1884.

| | | | | |
|---|---|---|---|---|
| ℞ | Betanaphthol | ℈j. | 1.30 | |
| | Unguenti plumbi oleatis | ℥ss. | 16. | M. |

| | | | | |
|---|---|---|---|---|
| ℞ | Betanaphthol | ʒss. | 2. | |
| | Sulphuris sublimati | ʒj. | 4. | |
| | Unguenti zinci oxidi | ℥j. | 32. | M. |

When the skin is markedly thickened, and itching is a prominent symptom, Vidal makes use of an application consisting of one part of tartaric acid to twenty parts of glycerole of starch, or glycerin. Brocq is of the opinion that the above preparation is improved by the addition of salicylic acid, and gives the following modified formula:

| | | | |
|---|---|---|---|
| ℞ | Acid tartarici | 1 gm. | |
| | Acid salicylici | 50 cgm.—1 gm. | |
| | Glycerit. amyli vel glycerini | 25 gm. | M. |

In obstinate cases, especially when it attacks the hairy scalp or the genitalia, Vidal and others have witnessed good results from the use of storax, which may be applied pure, or diluted with two or three parts of olive oil or oil of sweet almonds. Creolin has been found of value in chronic eczema. It may be used as a lotion in the proportion of one drachm (4 gm.) to half a pint (256 gm.) of water.

*Mercury.*—The mercurial preparations are among the most valuable remedies that can be used in chronic eczema. They are particularly valuable in localized forms of the disease, and are more effective after the infiltration has lessened. The bichloride of mercury dissolved in water, in the proportion of from one to five grains (0.06 to 0.30 gm.) to the ounce (32 gm.), sponged frequently over the surface, often lessens the inflammatory action and allays the itching. The white precipitate and calomel in from five to sixty grains (0.30 to 4 gm.) to the ounce (32 gm.) of lard, cold cream, or zinc-ointment are of great value. The red and black oxides of mercury are also beneficial, but the nitrate and oleate are more effective when used in the form of weak ointments, or incorporated with tar, betanaphthol, or sulphur ointments.

*Sulphur, etc.*—Of the many remedies useful in the chronic stage, few are superior to sulphur, in from one-half to two drachms (2 to 8 gm.) to the ounce (32 gm.) of some fatty substance. Ichthyol contains a large percentage of sulphur, and is also useful. Inunction with the ointment of arsenicum oleate is followed by good results in some cases of chronic eczema. In cases attended by marked infiltration, the cadmium oleate ointment has been of decided service. Under the same conditions, especially when the extremities are invaded, the skin being har of a leathery consistence, the oleate of nickel, mixed with a su excipient in the proportion of one to sixty grains (0.06 to 4 gm.) t ounce (32 gm.) of lanolin or of petrolatum, will generally prove of be Iodoform, chrysarobin, pyrogallic, salicylic, and boric acids—the first in the form of ointments, and the last as a lotion in from ten to grains (0.60 to 4gm.) to the ounce (32 gm.)—are at times quite effe Gallanol or gallic acid anilide (prepared by boiling tannic acid with ani is reported to be useful in relieving pruritus and promoting cure in form of a three- to twenty-per-cent. ointment. It may also be adde talc and be used as a dusting-powder. A one- or two-per-cent. ointm of losophan is useful in old infiltrated cases attended with itching. I particularly adapted to scaly and fissured eczema. Chrysarobin may serviceably applied, suspended in collodion or gutta-percha soluti Thymol, five to fifteen grains (0.30 to 1 gm.) to the ounce (32 gm.) water or lard, is useful. An ointment of tannic acid, a drachm (4 gm.) the ounce (32 gm.), is sometimes beneficial, or a mixture of one part tannic acid to two parts of iodoform. Ointments of thymol iodide or europhen constitute good applications in squamous or seborrheic ecz Unna states that for seborrheic eczema we possess four valuable remedie sulphur, resorcin, chrysarobin, and pyrogallol, of which resorcin is the b being least apt to produce local or constitutional ill effects, though i few instances an idiosyncrasy exists which will not permit the use resorcin. This substance may be used in the form of powder, paste, s ointment, watery or alcoholic solution. Resorcin gives rise to a swell of the epidermis, by which painful fissures are healed in a single ni The favorite formula of the writer named is a solution of three drac (12 gm.) of finely powdered resorcin, with an equal quantity of glyce in six ounces (192 gm.) of alcohol, diluted with four times the quantit boiled water, or chamomile tea. Cavelli advocates the use of picric one and a half parts dissolved in two hundred and fifty parts of dist water, and applied five or ten times daily. Salicylic acid and borat sodium are likewise useful local applications in this form of eczema. ments containing sulphur sometimes prove too irritating, in which Brocq recommends the following combination:

| | | |
|---|---|---|
| ℞ Sodii boratis | 50 cgm.—1.50 gm. | |
| Acidi salicylici | 25 cgm. | |
| Zinci oxidi pulv. | 2 gm. | |
| Petrolati | 8 gm. | M. |

Brocq has also derived good results from the following preparatio

| | | |
|---|---|---|
| ℞ Hydrarg ovid flavæ | 50 cgm.—1 gm. | |
| Olei cadini | 1-3 gm. | |
| Petrolati | 20 gm. | M. |

This combination is thought to be particularly beneficial when seborrheic eczema is located in articular folds. Lotions and ointments containing betanaphthol are also efficacious. The glycerole of the subacetate of lead, prepared as follows, is especially valuable in some cases:

| | | |
|---|---|---|
| ℞ Plumbi acetatis .................. | gr. cxx. | 8. |
| Plumbi oxidi ..................... | gr. lxxxiv. | 5. |
| Glycerini ........................ | f℥j. | 32. |

Digest the acetate of lead and litharge in the glycerin (heated to 300° in an oil-bath) for half an hour, constantly stirring. Then filter in a chamber heated to 300°.

Sig.: Dilute the above from three to seven times with water and glycerin for application to the condition just named.

*Oils.*—The various oils, especially chaulmoogra oil, are useful. The oil of cajuput, weakened with olive oil, has sometimes given good results. Oil of cloves, rubbed up with lanolin, has at times been beneficial. The application of vulcanized rubber was recommended by Colson, and largely used by Hebra and Hardy. Beyond protecting the parts, excluding the air, and macerating the epidermis, its curative action is rather uncertain. It often aggravates the eruption by preventing the escape of the secretions and acting as an irritant. The same may be said of the medicated gelatine bandage introduced by Pick. While many useful and valuable remedies may be suspended in gelatine, as has been pointed out by George Henry Fox, Morrison, Morrow, and others, and kept in contact with the skin in a stable and fixed manner, with often effective results, yet as a rule, they are open to the objection just mentioned, and are only applicable to limited areas, and other methods of treatment have been found in most cases to be more efficacious. Dr. Lanara has obtained good results from an application composed of an ounce (32 gm.) of the alcoholic tincture of male fern, half an ounce (16 gm.) of rectified alcohol, one drachm (4 gm.) of tincture of myrrh, and one drachm (4 gm.) of crude pulverized opium. Dr. John Morton ascribes an excellent effect to an ointment of the juice of the leaves of the mudar plant rubbed up with lanolin. In old patches of eczema, cantharidal collodion, tincture of iodine, liquor potassæ, and other caustic preparations, in varying strengths, are sometimes used as blistering agents. In eczema marginatum Dr. Tarabrin relies upon tincture of iodine painted on the surface once daily or, as a substitute, two daily applications of tincture of iodine and spirit of turpentine mixed in equal parts. This mixture may be added to an equal quantity of the camphorated oil of the Russian Pharmacopeia (one part of camphor to nine parts of olive oil). The liniment of camphor of the United States Pharmacopeia contains twice as much camphor, and is made with cottonseed oil (20 per cent. of camphor, 80 per cent. of oil). The method of treatment just referred to is said to have marked effect in relieving the itching. Solutions of nitrate of silver in strength from ten to thirty per cent. in old patches of eczema have been successfully employed. A better agent to resort to, when the disease is circumscribed and obstinate, is cauterization either with the galvano-cautery or the actual cautery. Massage, compression (Bier method) and bloodletting are likewise powerful and useful adjuvants in the treatment of the chronic stage of eczema.

Massage acts in a most happy manner, whether the disease be extensive or localized. In the subacute form, in which the surface is dry, slightly thickened, or covered with papules, massage awakens the action of the dormant absorbents, increases the circulation, lessens or arrests the itching, and very often restores the skin to its natural condition. In chronic cases, in which there is marked infiltration, the skin being hard, fissured, dry, rough, thickened, even to a leathery state, and in which all medication has failed, the judicious use of massage will not only break up all exudation, but likewise stimulate the absorbents and assist in removing the inflammatory products from the tissues, and also lessen the irritation and relieve the itching.

Compression, which is usually applied in the form of bandages or medicated plasters, protects the parts, limits the spread of the disease, lessens the muscular tension, tones up the dilated capillaries, prevents the escape of serum, and assists in removing the products of inflammation. The ordinary muslin or gum bandage, or the medicated plasters[1] recommended by Unna and others, are the measures usually employed to make compression. Temporary stasis by applying a ligature to the limb by Bier's method, stimulates repair in old lesions.

Local bloodletting is an efficient means of assisting to eradicate chronic eczema. It is usually accomplished by puncturing the eczematous surface with a small, pointed knife; the engorged blood-vessels are thus relieved, the circulation becomes equalized, the action of the absorbents is re-established, and the exuded products are removed from the tissues, which, with the assistance of suitable local applications, soon regain their normal condition.

ECZEMA UNIVERSALE VEL LOCALE.—Having thus far systematically described the standard varieties of eczema and their immediate secondary changes, I next purpose to consider the peculiarities of the disease as it is observed in infancy, as well as in different parts of the body at other periods of life. Eczema may show itself upon all or any portion of the body; either covering the entire surface or being limited to certain parts. When it involves the whole surface of the skin, which is by no means a common occurrence, it is known as general eczema (*eczema universale*), in which the erythematous, the vesicular, the papular or vesico-papular lesions, or all combined are present. The eruption is more or less diffused,

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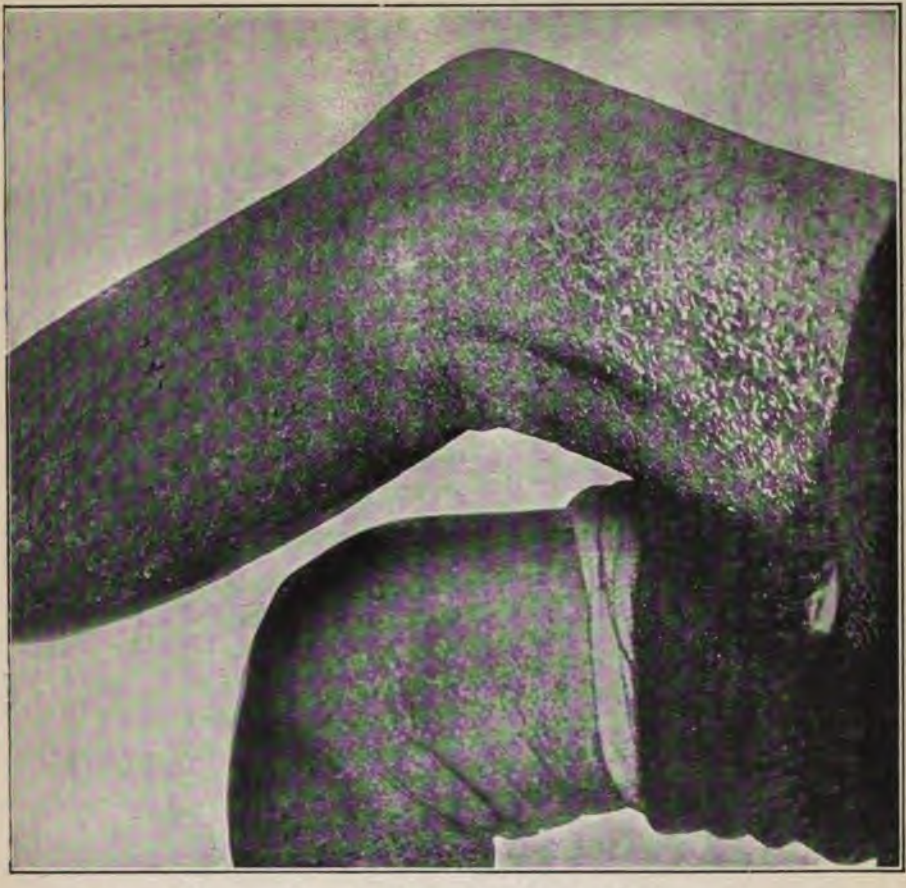
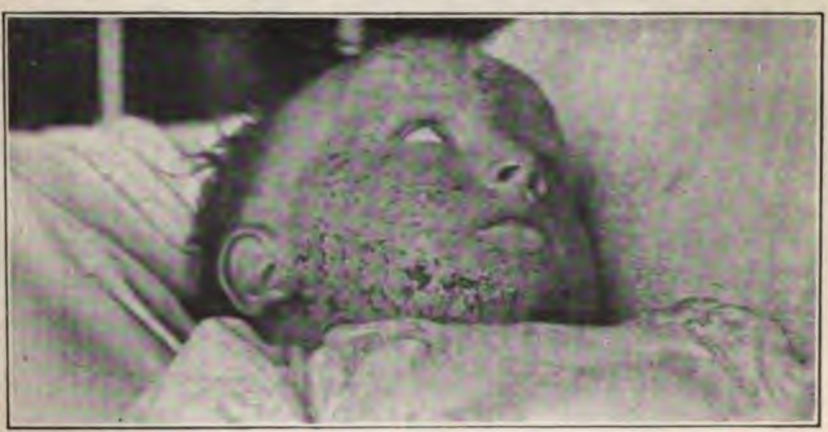
[1] See paper by author, "Medicated Plasters in the Treatment of Diseases of the Skin"—Transactions of Medical Society of the State of Pennsylvania, 1887.

# PLATE XIV



Universal Eczema, Leg and Lower Portion of Thigh. (See page 420)



Eczema (Infantile) of Face of a Child Nine Months Old. (See page 421)

and attended with intense itching and burning. It may run a brief course, and disappear entirely, or, as frequently happens, in subsiding either leave a general irritable condition of the skin or one or more patches which may linger for some time. At times a general chronic eczema may follow the universal acute variety, in which the whole surface from head to foot is red, raw, thickened, and fissured, covered partially with crusts and scales, and intolerably itchy. Ordinarily, however, eczema manifests a preference for certain regions of the body, and appears in the form of one or more patches of all sizes and shapes, varying, of course, according to the exciting cause and the part attacked. As it exhibits peculiarities and modifications in its course, due to age and the part invaded, it will be necessary, first, to speak of eczema as it appears in the very young—the infant; and, secondly, of its manifestations as seen upon certain localities of the body.

ECZEMA INFANTILE.—Infantile eczema is the most frequent of the cutaneous diseases of childhood—that is, from the birth of the babe until about the fifth year of age. The eruption presents at this early period of life certain characteristic not usually observed in the adult, owing to the soft and delicate structure of the skin in children. The integument at this time of life is exceedingly tender and sensitive, and therefore becomes more readily congested and inflamed from the least internal disturbance, as from improper or insufficient food, nervous excitement, etc. A scanty supply or altered quality of mother's milk, or the constant use of so-called modified or sterilized cow's milk is a powerful factor in the production of infantile eczema.[1] The milk is rendered unwholesome by menstruation, pregnancy, passion, anxiety, or disease. In the absence of any unhealthy character in the lacteal fluid, faulty assimilation renders the babe prone to attacks of eczema, while many rebellious cases are due to deficient excretion from the slightest outward irritation, as from the influences of heat and cold, or the too frequent use of soap and water. Among other causes of local irritation may be enumerated woolen clothing, light clothing, dyed clothing, and neglect to promptly remove wet diapers.

Infantile eczema may appear in the form of any of the varieties already described, usually beginning with erythema and running through all the primary forms of the disease, and attended with marked secondary changes. It ordinarily commences at a very early age, as an acute variety, subsides into the chronic, and often remains stationary for years. The eruption may be mild or severe, and may involve all or a portion of the body. It generally appears about the head and face, the cheeks in particular being first affected with a variously sized reddened patch, with some papulation, and more or less heat, itching, and swelling. The local irritation causes the little sufferer to scratch incessantly. This gives rise to an increase of the disease and the pouring out of serum, which dries into crusts and scales, which may in turn be torn off in the vain effort to obtain relief. The continued irritation may thus develop a reddened, raw, and excoriated surface, covered more or less with crusts and scales. In some, especially the scrofulous, the eruption will partake of the pustular variety, and cover at times the entire head and face; the surface being also the seat of high inflammatory action, pus is rapidly poured out, which desiccates into thick yellow and yellowish-brown crusts and scales, beneath which the parts are raw and exuding. This condition is commonly called *crusta lactea*, or milk crust. The irritation is intense, causing the child to suffer agony; the high inflammation, the raw and torn surface, thickened and often enormously swollen and studded with crusts, having a most pitiable aspect. The desire to scratch will continue unabated, even though the hands be muffled, and the child closely watched by day and night. Sufficient sleep is often out of the question, the little one only dozing for a time, after having become thoroughly exhausted, soon to awaken with renewed efforts to allay the intolerable itching. Children thus affected lose flesh, become pale, thin, take their food badly, and often pass into a marasmic state. Death may even occur, as in the case of generalized eczema described by Le Géndre, the patient being a child, six months old, in whom the disease had existed for two months, associated with an uncontrollable diarrhea.

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[1] See paper by author on "The Cause and Treatment of Infantile Eczema," the Medical Bulletin, January, 1888.

At times, the cervical glands, from sympathetic irritation, will become enlarged and cutaneous abscesses supervene, particularly upon the scalp, from inflammatory action involving the sebaceous glands and deeper parts. These secondary lesions may appear at once or in successive crops. They exhibit a low grade of inflammation, and are attended with very little pain. They are of all sizes and shapes, in color a deep red or purple, soft and fluctuating in some, and discharging in others a thin or purulent secretion often mixed with blood. The ears are sometimes affected, and become red, swollen, moist, or dry, and frequently covered with scales. Fissures occur at the junction of the pinna with the scalp, and at the lower margin of the lobule. The ears may be affected primarily, or by extension of the disease from the head or face. The forehead may be the seat of eczematous patches, usually passing down from the scalp. When the eyelids are involved, the Meibomian glands become red, thickened, and increased in activity, the cilia stick together, causing the eyelids to be glued together in the morning. The nose is usually exempt, but the mucous membrane within the nostril may be plugged with crusts. Eczema is frequently observed in infants in the flexures of the joints, and upon those regions where the integument is arranged in folds, or where one portion comes in apposition with another, as on the neck, axilla, abdomen, groins, and nates. These surfaces, which are red, raw, and moist from close contact and friction of the two parts, constitute the condition described by some writers as *eczema intertrigo.* This form of infantile eczema appears and disappears usually very rapidly, often relapsing, however, to disappear again upon proper treatment. It will not cause, as a rule, much itching, but when occurring about the groins and nates the pain is often very great from the chafing of the clothes and the irritant action of the discharges.

Finally, eczema may attack both the superior and inferior extremities. The eruption, especially when it attacks the bends of the elbows and knees, is often attended with considerable infiltration and cracking, causing much pain and interference in the ordinary movements. After the severe character of the eruption has passed away the surface becomes generally red and thickened, showing also more or less papulation, with the formation of scales.

Besnier distinguishes three forms of facial eczema among children. One occurs in lymphatic or scrofulo-tuberculous subjects, and is not attended by much itching, but gives rise to free secretion and is often associated with phlyctenular keratitis. A second form coincides with dentition, and is marked by intense itching as well as by symptoms of buccal irritation. A third variety has but little pruritus, and takes its rise around the sebaceous and sudoriparous glands, begins in the scalp, causes abundant desquamation and thinning of the hair.

**Diagnosis.**—The diagnosis of infantile eczema can generally be made without any difficulty. The only diseases with which it is liable to be confounded are syphilis, pediculosis, vegetable parasitic affections, scabies, and urticaria.

*Infantile syphilis* resembles eczema more perhaps than any other of these affections. The history, however, of the case, the senile facies, and the presence of snuffles frequently establishes the diagnosis before an examination of the eruption is made. Syphilis in the infant has a predilection for certain parts, as the face, especially around the mouth and nose, the anus, buttocks, and genital regions. The eruption is of a darker color, like raw ham, and the papules if present are larger and more flat than in eczema. The syphilitic eruption has also a circular, puffy, and dry appearance, attended with the formation of a few dirty, adherent scales, but is red and raw about the anal and genital regions from the irritation of the secretion of these parts and the contact of one surface with another. The characteristic moisture of eczema is not present except around the mucous outlets; neither is there the infiltration and itching so constant in the former affection.

*Pediculosis* may give rise to an eruption that resembles eczema, but the presence of the insects or nits, the scattered lesions, and the peculiar hemorrhagic spots on the body, would be conclusive against the disease being eczema. *Vegetable parasitic diseases* rarely affect infants in arms; two cases of ringworm, in which the little patients were less than nine months old, have, however, come under my observation—the one on the cheek, the other on the head. Both cases were traced to contagion. The first contracted the disease from the mother; the second from an older sister having ringworm, who nursed the infant. The parasite in both set up marked irritation on the surface very similar to eczema. The history of contagion, the circular arrangement of the patches, the elevated borders, and finding of the fungus by a microscopical examination set all doubt at rest.

*Scabies* in infants may simulate eczema, but the development of the eruption between the fingers, the flexures of the wrist, ankles, and feet, its absence from the face and scalp, the history of contagion, and the discovery of the furrows terminating in one end in a vesicle or pustule, in which the acarus is imbedded, are features which distinguish it from the latter disease. *Papular urticaria* may resemble eczema. The acute and sudden development of wheals upon some part of the surface, which disappear to reappear again; the occurrence of scratched papules, with an erythematous surface and fading wheals, with the absence of moisture and infiltration, should prevent any error.

**Etiology.**—The etiology of infantile eczema has been incidentally mentioned in the consideration of the first part of this subject. It is important in this connection again to make some reference to its causes, as upon their detection and removal depends in great part its eradication.

Some infants are born with a predisposition to eczema or other cutaneous affections—that is, they have either poor blood, a weak, nervous system, or some of the organs, mainly the skin, are in a debilitated condition. Such a predisposition being present in the system, the slightest exciting cause lights up the disease.

According to my experience, the most prolific source of infantile eczema is improper or insufficient food. In many cases it will be found that the infant has been given various articles of table-food that are unsuited to its delicate stomach. Irregularity in the time of feeding, whether frequently or at times at too long intervals, often produces functional derangement of the digestive organs, followed by an attack of eczema. The time of feeding, and the quantity allowed may be correct, but the quality of the mother's milk may be at fault. This latter may be due to debility or mental anxiety, or to indiscretion in diet on her part. Among the many other causes that excite eczema in infants are too frequent washing with strong soaps, neglect of cleanliness, scraping the scalp with combs and brushes to remove the sebaceous collections, exposure to heat and cold, and vaccination. The use of rough and harsh clothing, as flannels, dyed goods, and the negligent arrangement of bands, pins, and buttons, are also sources of the disease. In one case I examined, a pin run through both skin and roller by a careless nurse had been the starting-point of the eruption; in another, a large, hard, rough button; and in many, flannel and dyed goods brought in contact with the skin were the cause.

**Constitutional Treatment.**—The successful treatment of infantile eczema depends upon, first, good hygiene; the room should be suitably heated, ventilated, and kept free from slops and soiled linen. The child should be properly but not tightly clothed, and taken out in the fresh air and sunshine daily for several hours. Great care must always be exercised to avoid abrupt changes of temperature both in the nursery and while out of doors. Rest and plenty of sleep are essential, and if they can not be procured naturally, owing to the irritation of the disease, appropriate remedies should be administered. The diet should receive the strictest attention from those in attendance; the time of feeding should be regulated according to the age and strength of the child, and the intervals between feedings should not be too short, and the infant should not be allowed too much at once. The quality of the food should be carefully ascertained, and, if it be poor, should be corrected. The mother's milk can frequently be improved by giving her certain nutritious articles, as milk, cream, breakfast cocoa, broth, and codliver oil, and cautioning her against the use of those that conduce to a faulty state of her milk. Notwithstanding all efforts, the quality of her breast-milk may continue poor, and then it will be necessary partially or completely to wean the infant and substitute either a wet-nurse or artificial feeding; the latter often having to be resorted to from birth. The most efficient substitute for breast-milk is pure, fresh undiluted cow's milk, sweetened with sugar, given in from two to eight tablespoonfuls at a meal. A little barley-water or lime-water may be added if necessary to prevent coagulation. Condensed milk, properly prepared with water, barley, or arrowroot water, is also valuable. Goat's or ass's milk, diluted with about one-third of barley-water and boiled, can be advantageously employed if diarrhea exist. Imperfect digestion may be overcome by pancreatizing the milk, or adding to it a teaspoonful of some aromatic water, as mint or cinnamon water. A change from one form of food to another is often attended with good results. About the sixth month it may be well to add to the milk either a teaspoonful of wheaten flour or oatmeal, the latter especially if there be constipation. All other forms of food should usually be interdicted until at or near one year of age, when animal broths, milk and bread, the yolk of an egg slightly boiled, either alone or mixed with milk, can be given. Meat and other solid food should not be allowed until the child is at least fifteen or twenty months old, and even then it sometimes produces indigestion, develops an eruption, and must be stopped for a time. In older infants, when the gastro-intestinal irritation is great and the integument much inflamed, immediate improvement may be obtained by withdrawing their usual food, and placing them again upon a milk diet. It is well in the majority of cases of infantile eczema, in the beginning of the treatment, especially if the alimentary canal is in any way at fault, to evacuate it thoroughly by the administration of calomel or mercury with chalk, rhubarb, or castor-oil, the doses to be graded according to age. I generally use calomel, occasionally adding a few grains of sodium bicarbonate, to be followed with a small dose of magnesium carbonate. Podophyllin and leptandrin are likewise useful. This preparatory treatment, which washes out the disordered secretions and often makes a marked impression on the irritable skin, should be repeated every second or third day, according to indications. Persistent indigestion may be removed by giving from one to two grains (0.06 to 0.12 gm.) of pepsin, alone or with a half a drop of the tincture of nux vomica three times daily. If diarrhea remains after the indigested food and acrid secretions are removed, warm applications may be made to the abdomen, and from three to five grains (0.18 to 0.30 gm.) of bismuth subnitrate and from one-half to three grains (0.03 to 0.18 gm.) of Dover's powder may be given every three hours. Bismuth and chalk, rhubarb and chalk, chalk mixture, with or without a few drops of laudanum, and the fluid extracts of geranium, rhatany, hematoxylon, and kino are also useful. In the majority of cases, however, the bowels are constipated, and require laxative remedies. Manna, senna, or sulphur, may also be used. Frictions over the abdomen, with codliver oil, castor oil, and tincture of aloes dissolved in olive oil, are excellent means of overcoming constipation. When there are no contra-indications, and the infant is fed from the breast, the use of laxatives or cathartics by the mother will prove of service. Healthy, robust infants respond promptly to mercurial cathartics, followed by one-half to one drachm (2 to 4 gm.) of the diastasic extract of malt after meals. Among systemic remedies which are of value in the treatment of infantile eczema, codliver oil and the syrup of the lactate of iron are the most effective. The compound syrup of the phosphates, syrup of the lacto-phosphate of lime, syrup of the hypophosphites of soda, lime, and iron, and the syrup of the iodide of iron, given in from three to forty drops in water, three or four times daily, are also valuable. Iron in some form is indispensable in many cases. The administration of alkalies to the mother, either in the form of one of the alkaline waters or of sodium or potassium acetate, ten to twenty grains (0.60 to 1.30 gr.), three times daily, often has a most beneficial effect. In infants artificially fed, and when the skin is hot, dry, and irritable, sodium acetate is the best remedy. If there is much constitutional excitement, rapid pulse, and marked irritability of the surface, sweet spirit of nitre or neutral mixture, with one-thirtieth to one-twelfth of a drop of tincture of aconite in each dose, is often followed by rapid amelioration of the symptoms. The pale, weak, and strumous are benefited by codliver oil, iron, the phosphates, hypophosphites, potassium chlorate, and at times very small doses of lime-water. It should be remembered that in case the child will not bear codliver oil by the stomach, the inunction method can be resorted to advantageously. Minute doses of corrosive sublimate, one-hundredth to one-seventieth (0.0006 to 0.00085 gm.) of a grain, three times daily, are sometimes followed by marked lessening of the congestion and itching, together with a rapid subsidence of the eruption. The older French writers, and recently Piffard, commend viola tricolor, especially in the pustular variety of the disease. It can be given in the form of the powder, tincture, extract, or infusion; the latter is usually the most preferable. The dose of the infusion varies from ten drops to a drachm (4 gm.), gradually increased until some effects are experienced from its use. Arsenic is said to be well borne by children, even in comparatively large doses, but it often happens that the reverse occurs, and eczema becomes aggravated by its use. The fact is that each case requires to be carefully considered, and the constitutional treatment carried out accordingly. Some will improve upon proper diet or alkalines, with or without laxatives, and others upon tonics and alteratives. Arsenic is rarely necessary, and may, as a rule, be discarded from the therapeutics of infantile eczema. Quinine is not infrequently of service, especially in malarious districts and when the disease occurs during the spring or autumn months. The alkaloid may be very well given in the syrup of yerba santa, the dose varying from one-half to a grain (0.03 to 0.06 gm.) once or twice a day.

**Local Treatment.**—Infantile eczema can not be treated locally in the same vigorous manner as in the adult, for, while the general indications may be similar, yet the delicate structure and extreme sensitiveness of the infantile integument render harsh measures unadvisable. Soothing applications are therefore demanded in the majority of cases, more especially in the acute forms, moderate stimulation being permissible only in the chronic variety of the disease. The affected part should not be washed too frequently, and soap should usually be avoided. Crusts, scales, and other extraneous material can be removed by an alkaline or emollient bath, alone or combined, or by some soothing oil or a poultice. A good alkaline bath, which is soothing and valuable, can be made by adding one-half or a tablespoonful of either powdered borax or carbonate of sodium or potassium to one gallon of water. From two to four tablespoonfuls of starch or gelatine, to the same quantity of water, will form an emollient application which may be used in alternation with the former. The medicated water thus prepared should be dashed or mopped over the surface, and the parts lightly sponged dry, and not rubbed. If it appears necessary to use soap, either to cleanse the parts or for the purpose of mild stimulation, either chamomile, sulphur, borax, betanaphthol, or camphor soap can be employed.

Applications of cold water, ice-water, or lead-water and laudanum are also found grateful and beneficial. Saalfeld advises[1] the application of equal parts of lead-water and a five-per-cent. solution of boric acid, or a five-per-cent. boric-acid ointment. The skin when moist should be dried with powder before the ointment is applied.

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[1] Deutsche medicinische Wochenschrift, July 3, 1890.

The inflamed areas can be soothed and protected by either ointments, oils, dusting-powders, or lotions. The ordinary zinc ointments and others alone often irritate the surface, and should not as a rule be employed. Cold cream, simple ointment, lanolin, and purified and prepared suet are preferable bases for ointments for the tender integument of the infant. Powdered arrow-root, lead or zinc carbonate, oxide of zinc, bismuth subnitrate, one or two drachms (4 or 8 gm.) of either to one ounce (32 gm.) of one of the above bases, form most efficacious applications in acute infantile eczema. They should be spread on an old piece of muslin and applied to the surface. The following combination is especially useful:

| | | | |
|---|---|---|---|
| ℞ Pulveris marantæ | ʒj. | 4. | |
| Zinci carbonatis | ʒj. | 4. | |
| Plumbi carbonatis | ʒj. | 4. | |
| Ungt. aquæ rosæ | ℥j. | 32. | M. |

It frequently becomes necessary to use a mild stimulant or alterative to relieve the irritation. The most serviceable and useful are the mercurials, sulphur, betanaphthol, camphor, and oil of chamomile. These agents can be added to one of the soothing ointments already named. The oleate of bismuth and the oleate of zinc are also excellent applications, and can be used, the latter in the form of powder and the former as an ointment. The following preparation can likewise be recommended:

| | | | |
|---|---|---|---|
| ℞ Pulv. opii | gr. iij. | 0.18 | |
| Acid. tannici | ʒss. | 2. | |
| Plumbi. carbonatis | ʒj. | 4. | |
| Olei anthemidis | ♏ v. | 0.30 | |
| Adipis | ℥j. | 32. | M. |

Another very good procedure is to brush a twenty-five-per-cent. solution of the fluid extract of geranium over the surface after the scales have been removed. Cucumber ointment and weak salicylic-acid ointment, are sometimes found beneficial. Cases due to external irritation are, after removal of the source, readily cured by application of a simple dusting-powder. If eczema of the scalp be due to lice, the hair should be cut short and an ointment containing ten grains (0.60 gm.) of calomel, or betanaphthol, or forty grains (2.60 gm.) of sublimed sulphur to the ounce (32 gm.) of excipient, with or without a few drops of phenol, applied to the seat of disease. In rebellious cases Boeck makes use of compresses moistened with a weak solution (1:500) of nitrate of silver. These are covered with gutta-percha paper and left in position two or three hours morning and evening. In the intervals a sedative ointment is applied. Where the itching is severe, five to ten grains of calomel (0.30 to 0.60 gm.), ten to sixty grains (0.60 to 4 gm.) of sulphur, three to thirty grains (0.18 to 2 gm.) of betanaphthol or camphor, five to thirty drops of oil of chamomile, or one to three grains (0.06 to 0.18 gm.) of phenol to the ounce (32 gm.) of a fatty base, will often afford relief. The ointments of the ammoniated, red or yellow oxide, and acid nitrate of mercury are valuable. A lotion containing one minim of creosote to the ounce (32 gm.) of water or one of chloral hydrate, two and a half grains (0.15 gm.) to the ounce (32 gm.) of peppermint-water, allays itching. For seborrheic eczema of the scalp, Besnier advises that the hair be cut, the scalp washed with soap, the face with warm water containing a little milk to dissolve the greasy secretions. An ointment of resorcin or sulphur is then applied. More effective stimulation can be obtained when necessary by the addition of a small amount of one of the tarry preparations. Saalfeld prefers an ointment containing one part of ammoniated mercury, five parts of balsam of Peru, and thirty parts of oxide-of-zinc ointment. In severe and obstinate general eczema in children, vaccination with animal lymph has been known to effect decided improvement; although as a general rule it is not advisable to vaccinate during the presence of a skin eruption. When the disease is associated with painful dentition, the gums should be lanced or rubbed with a solution of cocaine, insomnia controlled by a mixture containing bromide of sodium alone or in combination with a little chloral, while the oxide-of-zinc ointment with a little sulphur and camphor constitutes an effective local application.

Eczema of the Scalp (*Eczema Capitis*).—Eczema of the head is of very frequent occurrence, and manifests itself usually as the erythematous, the vesicular, or pustular variety, the lesion differing generally according to the age of the patient. In infants and children the pustular form is the most common, while in adults the erythematous and vesicular are most often encountered. In the adult, therefore, the last two forms are generally observed as the initial lesions, which tend to become chronic and develop slowly into that well-known secondary stage termed eczema squamosum. The eruption in its course may present at different times the erythematous, the vesicular, and pustular stages, followed by the formation of crusts and scales; on the contrary, it may begin in any form, and continue throughout its course unchanged. It may also present erythematous or vesicular patches upon one place, pustular in another, and a dry and scaly spot upon still another portion of the scalp. These conditions may be present at one and the same or at different times. The disease may involve a part or the whole of the scalp. It may begin in one or more patches, and continue thus without spreading, or it may, as is often the case, extend over the entire region of the scalp, and even down behind the ears, on the neck, and forehead. The itching is usually decided, except in the pustular variety, in which it exists in a modified degree.

Eczema of the scalp, however, presents certain modifications due to the presence of the hair, its length, its thickness, and the various methods of dressing it, according to habit or the demands of fashion, that call for special consideration. These modifications depend upon the discharges matting together the hair, and forming adherent crusts and scales. Thus, a secreting eczematous state of the scalp, occurring in an individual with the hair cropped short, presents a different appearance from that which is observed in one having long, thick, bushy, and neglected hair. In the former the hairs do not become readily matted together, and, if matting occurs, they can be easily separated and the crusts and scales removed. In the other, the exuding fluid entangles the hairs, which, with the crusts and mingled sebaceous secretion, form a compact mass. This matting together of the hair is increased by persons neglecting either to comb, brush, or disentangle it for fear of still more increasing the inflammation. The unkempt mass upon the scalp excites considerable irritation and causes the parts to be thoroughly scratched. This stimulates the numerous sebaceous glands to pour out their contents, the secretions mingle upon the surface, and, by decomposing and setting free fatty acids, produce a rancid, musty, disgusting odor. This repulsive condition attracts lice, and at times vegetable parasites, and has been termed, in Vienna, plica polonica. In one instance, in the outdoor department of the Philadelphia Hospital for Skin Diseases, some five years ago, I observed a young immigrant girl, about fourteen years of age, who presented a loathsome appearance; upon separating the matted hair, and picking off some greenish-yellow crusts from the parts, the surface beneath was seen to be raw, covered with pus and filled with maggots, from which issued a foul and sickening odor.

A swelling of the posterior cervical glands often occurs as an accompaniment to eczema capitis, with, at times, the formation of abscesses and loss of hair. These enlarged subcutaneous glands, which are sympathetically excited, increase or diminish in size as the affection becomes severe or improves. This swelling of the glands, as well as the formation of abscesses, happens more frequently in those who are scrofulous or poorly nourished.

This form of eczema may continue for years, if not arrested; or it may, after lasting months, undergo spontaneous involution. In the latter event, in patients having long hair, when the eczematous fluid ceases to be poured out, the young and growing hairs push forward the old mass of matted-together material, and permit it to be easily removed by the scissors. As a rule, the condition just described is succeeded, after the removal of the hair, by a red and scaly surface which may continue to exfoliate epidermic scales for some time. In persons having short hair the cessation of the exudation and the falling off of the crusts is followed by the same squamous condition. The loss of hair which sometimes occurs is usually only temporary, the instances in which permanent baldness results being exceedingly rare.

The treatment of eczema of the scalp requires the removal of the cause, attention to the general health, if necessary, and the use of certain local measures, according to the variety and stage of the eruption. In case the disease be of the pustular variety, and the surface covered generally or partially with crusts, the long hairs pasted down or matted together by the exudation, the parts should be thoroughly saturated with some one of the oils—olive, sweet, almond, ergot, petroleum, or codliver oil—which softens up the mass, removes the crusts, and prepares the surface for further medication. If the exudation be great and the crusting extensive, it may be necessary to leave the oil on for some hours. The application of one of the oils—I generally prefer the oil of ergot, on account of its also having some slight astringent action—should be repeated twice or three times daily for several days until the parts are relieved of the inflammatory products. In the event that it becomes necessary to use water and soap, some days at least should elapse before applying it, and then one of the medicated soaps, having in it either beta-naphthol, tar, or corrosive sublimate, should be employed. Shaving and cutting the hair are unnecessary in the great majority of cases, and should in particular be avoided by girls and women having a long and luxuriant growth. If pediculi, nits, or any vegetable parasitic disease exist as a complication, they can be removed by solutions of mercury or copper oleate ointment and other appropriate remedies. After the surface has been cleansed or the complications removed, if the pustules continue to appear or the erythematous or vesicular condition remain, the oil of ergot can be applied in the same way, or lead or zinc carbonate, or bismuth subnitrate, one or two drachms (4 or 8 gm.) of either to three or four ounces (96 or 128 gm.) of the former, can be used. In case a mild stimulant is required, equal parts of the solution of mercury oleate and oil of ergot are valuable. Tannic or gallic acid can be added to one of the oils, glycerin, or petrolatum, and applied to these parts. The following has proved of service:

℞ Hydrargyri chloridi corros. ....... gr. v. 0.30
Glycerini ....................... f℥v. 160. M.

The fluid extract of geranium is also valuable.

Oils, solutions, and even ointments should be lightly sponged or mopped over the surface, in order to avoid rough rubbing or irritating still further the parts. Soothing ointments can likewise be used, although I prefer oils and lotions, on account of their easy application. Zinc, lead, and bismuth ointments are most useful, and can be made stimulating when desired by the addition of sulphur, oil of chamomile, or a small quantity of naphthol. For a more marked stimulation, especially in the squamous variety, the various tarry preparations and mercurials are all valuable, beginning with a moderate strength, and gradually increasing until the desired effect is produced.

In place of tar, Piffard makes use of the following preparation:

| | | | |
|---|---|---|---|
| ℞ Acidi salicylici | gr. x-xx. | 0.60-1.30 | |
| Ol. lavandulæ | fʒiij. | 12. | |
| Ol. citronellæ | fʒj. | 4. | |
| Ol. eucalypti | f℥ij. | 64. | |
| Ol. ricini | f℥ij. | 64. | M. |

Again, similar agents are most efficacious in the squamous variety used in the form of a lotion. Thus the oil of cade, a drachm or two (4 or 8 gm.) to the ounce (32 gm.) of either alcohol, spirit of rosemary, or five to ten grains (0.30 to 0.60 gm.) of corrosive sublimate to the ounce of water, will be found of great utility. Very obstinate cases yield sometimes to the application of tincture of iodine or one of the blistering agents. Oils are adapted to some, ointments to others, and instances occur which can not bear the least stimulation, owing to a peculiarly sensitive condition of the skin. Care should therefore always be observed to avoid stimulating unduly the scalp, thus increasing the eruption in the endeavor to do good.

ECZEMA OF THE EARS (*Eczema Aurium*).—Eczema may affect the auricle and the external auditory canal, and the hearing may suffer by the involvement of the latter part. The erythematous, vesicular, papular, and pustular varieties may attack these parts, or spread to them from adjacent surfaces affected with the disease. Eczema of the ears occurs either as an acute or a chronic affection among all ages and in both sexes, but is more frequently observed in children and females. One or both auricles may be involved, usually both, and the disease may implicate the entire ear or be limited to certain portions. In the acute variety the ears are red and swollen, and are attacked with mild or severe burning, itching, or stinging sensations. The morbid action may extend into the meatus, closing it, and producing temporary deafness. Very often, by the formation of vesicles or pustules, the whole or part of the auricle becomes covered with crusts, or is the seat of general redness, moisture, and considerable infiltration, with more or less desquamation. The eruption may be confined to the posterior surface of the ear, the natural depressions being the seat of fissures, disappearing at times to reappear and spread over all or part of its surface. In other cases the external auditory canal is also involved, being dry and scaly, and the seat of intolerable itching, vesicles appearing sometimes on the meatus and the membrana tympani. There may be in these cases a feeling of fulness, giddiness, noises, or temporary deafness. As a few of the direct causes that assist in bringing about these obstinate cases of eczema of the ears, may be mentioned exposure to changes of temperature, spectacle-frames, ear rings, dyed fabrics, especially ribbons uncleanliness, picking the auricle, the meatus, or the canal for the removal of wax, and acute or chronic catarrhal otitis. It occasionally results from the growth of the aspergillus in the ear. It is often difficult to apply remedies on account of the anatomical arrangement of the ears. Scales and crusts should be removed, and soothing ointments of zinc, lead or bismuth should be carefully spread over the affected surface. Sulphur or betanaphthol with extract of opium and belladonna, can be added when necessary. After the acute stage has passed, ammoniated mercury, ten to thirty grains (0.60 to 2 gm.) to the ounce (32 gm.) of cold cream, is of advantage; also tar in large or small quantity, according to the indications, for stimulation is likewise of value. In the involvement of the canal the crusts or wax should be first softened with a few drops of oil of sweet almonds, and washed out occasionally with hot water. The following combination, painted in night and morning, will allay and sometimes remove the irritation:

| | | | | |
|---|---|---|---|---|
| ℞ | Plumbi carbonatis | ʒss. | 2. | |
| | Atropinæ sulphatis | gr. ij. | 0.12 | |
| | Ol. olivæ | f℥ss. | 16. | M. |

The canal may also be painted with tannic acid dissolved in glycerine, one to two drachms (4 to 8 gm.) of the former to an ounce (32 gm.) of the latter, or weak or strong solutions of zinc sulphate, phenol, silver nitrate, or potassa caustica, or a thirty-per-cent. solution of the fluid-extract of geranium. Care should be exercised to prevent injuring the membrana tympani by the use of any of these preparations, and agents should be at hand to counteract their effect in case of accident.

Eczema of the Face and Neck (*Eczema Faciei et Colli*).—Eczema frequently occurs on the face and neck, either by spreading down from the scalp or developing originally upon these parts. The eruption, however, when attacking the chin and neck, has no special peculiarities, and it will not, therefore, be necessary to treat of it separately, beyond the general description already given in the first part of this chapter. On the contrary, eczema, when attacking the face, presents so many modifications in its general character, according as it affects the smooth or hairy surfaces and each individual part, as to call for a particular description of each condition and portion invaded. Eczema of the smooth part of the face may be either acute or chronic. It may appear in the form of any of the standard varieties, attended with more or less secondary changes. The erythematous, vesicular, and pustular are common; the former more particularly during and after adult life, and the latter in children. The entire surface may be red, infiltrated, moist, crusty, and scaly, or patches may be noticed on the forehead, eyelids, cheeks, nose, and lips. The itching is most intense, especially in the chronic form, the sufferer often filling the buccal cavity with air and pounding with the hands on the surface of the cheeks and adjoining portions in a vain effort to get relief. Relapses frequently occur on the least exposure or the slightest cause, owing, no doubt, to the delicate nature and the highly organized condition of the skin of the face. Betanaphthol and phenol are beneficial in these cases, from five to twenty grains (0.30 to 1.30 gm.) of the former or from three to ten grains (0.18 to 0.60 gm.) of the latter to an ounce (32 gm.) of cold cream, or the same quantity of lanolin. A drachm (4 gm.) of lead or zinc carbonate or arrow-root also added, may be of service. The ointments of zinc oxide and bismuth subnitrate are likewise valuable. The efficacy of any of the above preparations is often increased by dusting equal parts of zinc oleate and arrow-root powders, or bismuth subnitrate, over the surface, first having, of course, applied a thin film of ointment. Corrosive sublimate, betanaphthol, or phenol, suspended in water, in the proportion of five to ten grains (0.30 to 0.60 gm.) of either of the former or five to ten drops of the latter to four ounces (128 gm.) of rose-water, sponged over the surface, gives occasionally great relief. Hyde recommends strips of cold raw meat, laid over the surface, for immediate beneficial effect. In senile eczema of the head and face, Bulkley is fond of the following preparation:

| | | | | |
|---|---|---|---|---|
| ℞ | Phenol. liq. ................. | gr. v-x. | 0.30 to 0.60 | |
| | Acidi tannici .............. | ʒj. | 4. | |
| | Ung. aq. rosæ ............. | ℥j. | 32. | M. |

Eczema of the Beard (*Eczema Barbæ*).—Eczema in attacking the hairy portion of the face assumes a similar condition to that observed on the scalp in the same disease. The alteration will not, however, be so great from neglect, as the face usually receives more care and attention than the scalp. The eruption generally appears in pustular form, as a rule at the orifice of the hair-follicles, each one being pierced by a hair, and involves all or a portion of the beard, extending in some cases to the eyebrows, eyelids, and outlets of the nostrils. The pustules dry up into yellowish, greenish, or brownish crusts, which mat together the hairs, cling to the skin, and, upon their removal, expose a red, infiltrated, scaly, or moist surface. Patients may complain of itching, but more commonly a burning sensation or pain is experienced, especially during the formation of the pustules. The eruption may disappear spontaneously after the acute stage, but more frequently it is continued into the chronic form. In passing into the latter the inflammatory process extends deeper, and affects the hair-follicles, as in sycosis. Abscesses may now form, the skin becomes more thickened and infiltrated, and the pressure and inflammatory action obliterate the follicles, leading to permanent loss of hair, and often to the formation of scars. The sparse and poorly developed hairs, with all the now marked and apparent secondary changes occasion very great disfigurement. Eczema may be limited to the beard or it may spread to the adjoining smooth parts. It will thus be seen to differ from sycosis. In sycosis the inflammatory process is situated deeply in the corium and subcutaneous tissue, while in eczema it is more superficial. Again, papules and tubercules may be present in sycosis, but are absent in eczema of the beard. The diagnosis between eczema and ringworm has already been considered.

The treatment, owing to the tedious nature of the affection, is often slow and unsatisfactory, but the ultimate result is usually good. Some individuals are benefited by shaving the beard as often as every other day, or when required; others derive no benefit from this procedure, and now and then cases are aggravated by it. I usually cut the hair short, remove, by one of the oils already named, or a poultice, crusts and all exudation, and apply one of the soothing ointments. The disease may then be treated upon the general principles laid down for the management of acute eczema. Shaving may be tried in the event that the disease shows no signs of yielding. In obstinate cases, after removing the crusts, I puncture with the small needle-knife all the pustules and the infiltrated skin every day or two, allow the parts to bleed freely by dashing very warm water on them, mop the surface dry, and apply the zinc ointment with or without sulphur, or a small quantity of one of the mercurials, or diachylon-ointment over the surface. This method of treatment I usually find all-sufficient, both in the acute and chronic varieties. Anderson, in some stubborn cases, has epilated with advantage.

ECZEMA OF THE EDGES OF THE EYELIDS (*Eczema Tarsi; Ophthalmia Tarsi*).—This is a common disorder in scrofulous subjects, more particularly in children, and may or may not be accompanied with conjunctivitis, or strumous ophthalmia. It involves the hair-follicles and glandular apparatus of the eyelids, and appears in the form of small pustules, similar to those observed in eczema of the other hairy parts of the face. The edges of the eyelids are red, swollen, excoriated, infiltrated, covered with purulent exudation, exhibiting gray or yellowish crusts, the hairs and often the edges being glued together. Itching is occasionally present. A continuation, from neglect of this morbid condition, may cause lachrymation, which irritates the skin and gives rise to an eczematous eruption; or, the discharges being retained, ulcers may be developed, the glands and follicles obliterated, and, finally, a partial or complete loss of the eyelashes may supervene. The retraction of tissue may be so great as to occasion entropion or ectropion. The treatment demanded is usually both general and local. Codliver oil, quinine, iron, and calcium should be given in alteration. The eyes should be bathed frequently with hot water, to which a small quantity of bicarbonate of sodium or borax may be added. In case the lids are difficult to separate, notwithstanding the bathing, a small piece of fresh butter or a few drops of olive oil can be smeared along the edges, facilitating their opening and preventing their adhesion. Permanent benefit can be obtained by removing the discharge, everting the lids, and painting the diseased edges with a weak solution of silver nitrate or potassa caustica. In addition, the patient or attendant may employ on the lids, once or twice daily, a weak ointment of the yellow oxide of mercury, and in the more chronic cases the ointment of the red oxide of mercury, from one-half to a grain (0.03 to 0.06 gm.) to the ounce (32 gm.). An ointment consisting of about ten grains (0.60 gm.) of resorcin to the ounce (32 gm.) of cold cream is sometimes serviceable in this condition. Weak ointments of the white precipitate or of the nitrate of mercury have also been employed for the same purpose.

In more severe cases, it may become necessary to extract the eyelashes. Eczema of the eyelids will often be found to depend upon some disease or refractive error of the eye, and the attention of a skilled oculist is not only required but demanded to correct or remove the cause.

Eczema of the Nose (*Eczema Nasi*).—Eczema may attack the nose either alone or in connection with other parts of the face. Either a part or the entire organ may be red, thickened, covered with exudation, and greatly increased in size. The disease usually affects the surface around the alæ and the entrance of the nostrils, which become red, swollen, the seat of pustules pierced with hairs, the mucous membrane likewise participating in the morbid process. The pustules sometimes run together, a thick, purulent secretion exuding, which forms into crusts, stopping up the entrance to the nostril. This condition impairs the nasal respiration, and the mucous membrane beneath becomes congested, thickened, sometimes ulcerated. This, in rare cases, owing to the crust being picked off constantly, has led to perforation of the cartilaginous septum.

Eczema of the nose is apt to excite rosacea. *Syphilis* and *lupus* of the nose might be confounded with eczema of these parts, but the diagnosis is rendered comparatively easy in the former by the history and the presence of other concomitant symptoms of syphilis in the body, while in the latter the characteristic chronic nature of the affection, the absence of itching, and the peculiar local lesions of lupus, are sufficient evidence upon which to base an opinion. The success of the treatment largely depends upon the assistance of the patient. The surface must not be picked or torn in the effort to remove the crusts, but should be first softened with oil or a mild ointment, and then they can be taken away with ease and without injury to the parts. Zinc oleate, weak citrine or white-precipitate ointment, with a few drops of oil of chamomile or oil of cade, in case the parts require more stimulation, form important and useful applications. In the involvement of the mucous membrane, pencilling the surface with solutions of zinc sulphate or silver nitrate is effective. Zinc-oleate powder, as employed by McCall Anderson as a snuff, or nasal suppositories, composed of zinc oxide, two grains (0.12 gm.), with cacao-butter, will be found valuable. The extracts of opium and belladonna or hyoscyamus, with a small quantity of lead acetate, can also be used with decided results.

ECZEMA OF THE LIPS (*Eczema Labiorum*).—This occurs either on the lips alone or with the disease upon some other part of the face. The eruption may appear on one or both lips, and may implicate the vermilion border and mucous membrane alone, or it may invade together or separately the integument covering the orbicularis oris muscle. In case it should be confined to the latter, it will partake of the nature of the eczema previously described, either on the smooth or hairy part of the face. Limited to the former, the disease generally assumes the inflammatory or squamous form. The lips usually become red, hot, swollen, the exudation of serum not only filling up the loose cellular tissue, producing much deformity, but often oozing out on the surface, frequently gluing the lips together, especially during the night while asleep. The mucous membrane may, on the other hand, be simply red, and the seat of constant desquamation. The eruption is often complicated with secondary changes, the formation of fissures at the angles of the mouth and the centre of the lips, those in the lower one being the most common. The movement of the lips, under such circumstances, causes a very uncomfortable feeling, often absolute pain; the parts become more irritable in proportion to their activity, the fissures extend deeper, blood as well as serum being frequently poured out. The unpleasant sensation thus experienced, whether from the severe inflammation, fissured state, or loss of epithelium, causes the patient often to move the lips backward and forward, or to apply the tongue to the parts to convey mucus or saliva to the surface in order to obtain some relief. These increased movements of the parts, and the natural effort to alleviate the suffering, only aggravate the eczema. Again, scraping the mucous membrane of the lips with the teeth (which is one of the prominent exciting causes of the disorder) to get rid of the desquamation, or picking the latter from the surface, further increases the disease, and prolongs the suffering. In strumous children eczema of the upper lip is not infrequently produced in consequence of chronic coryza. Eczema of the lips exhibits a tendency to recurrence. Kaposi describes a form which is met with most frequently in elderly women, attacking particularly the vermilion border.

Herpes labialis and syphilis of these parts may be mistaken for eczema. Herpes appears as groups of vesicles, and runs an acute course. Eczema involves all or part of the surface, and is usually tedious or chronic in its course. Syphilis of the lips seldom affects the entire surface, but generally tends to locate itself as elevated patches and fissures at the angles of the mouth.

The treatment of eczema of the lips is most difficult, owing to the fact that they are almost constantly in motion. The various astringent lotions are useful. The ointments of zinc, lead, and bismuth oleate, lightly smeared over the surface, are often invaluable. Tartaric acid and salicylic acid in the form of ointments are also recommended as effective, especially in the case of children.

The compound tincture of benzoin and the fluid extract of geranium are also exceedingly efficacious, pencilled frequently over the surface and into the fissures. Before a cure can be affected it will often be necessary, especially when fissures exist, to afford rest and support to the parts by the application of adhesive or medicated plasters, as described by me in 1879.[1] The beneficial influence of plasters, cut in strips and applied to the surface, is most strikingly evinced in eczema of the lips. The mucous surface in this disease is torn open with every movement of the lips, and all the lotions, ointments, and powders will not soothe the muscular irritation and heal the parts until they are protected and placed at rest. In order to accomplish this purpose, adhesive strips can be made to encircle the head and allowed to meet posteriorly at the nape of the neck. In this manner the movement of the lips is controlled, the raw surface protected, the irritation soothed, and the disease promptly and effectually arrested. In removing the strips, care should always be taken to detach both ends, and draw gradually to the centre, otherwise the mucous surface may again be torn open.

ECZEMA OF THE TONGUE (*Eczema Linguæ*).—Eczema occasionally attacks the tongue. Its development is particularly favored by the existence of gastro-intestinal disorder. The evolution of eczema of the tongue is essentially similar to that upon the skin, and it may assume the most fantastic outlines. Treatment should above all be directed to the condition of the digestive tract. Tobacco, liquors, and spices must be avoided. Locally, boric acid, salol, sulphur, or hyposulphite of sodium should be used in the form of pomade, gargle, or glyceride. Cases have been recently reported by Besnier and De Molènes.[2] The latter, in a very stubborn case, made use of equal parts of lactic acid and water. Light scarifications or galvanism may also be advised.

ECZEMA OF THE BREAST AND NIPPLE (*Eczema Mammarum*).—Eczema may attack one or both breasts, and run an acute course or become chronic. Both breasts, however, are usually involved. It occurs either as the erythematous or vesicular variety, with or without secondary changes, covering part or all the breasts, and often extending between or below them. The nipples of females are frequently the seat of the eruption, which takes on the vesicular or inflammatory form, with the development of crusts and fissures.

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[1] See paper by the author, "Some Important Topical Remedies and their Use in the Treatment of Skin Diseases." Transactions of the Medical Society of the State of Pennsylvania, vol. xii, 1879.

[2] Medical Bulletin, May, 1890, p. 171, and June, 1890, p. 250.

In some the nipple is surrounded with a thickened patch, the surfaces are denuded of epidermis, and are red, swollen, fissured, hot, dry, or moist, and attended with intense itching or pain. In severe cases the nipple is retracted and covered with crusts or serum; occasionally blood oozes from the fissured surface, and sometimes abscesses form. Mothers are often compelled, owing to the great suffering, to discontinue suckling for a time or to wean entirely their infants. Nursing women are more liable to be affected with this form of eczema, but it is also met with in those who are not nursing, occasionally being seen in single women, and has sometimes been met with in men. Eczema of the nipple usually appears during pregnancy or lactation, but may follow as a scrofulous manifestation, or be dependent upon scabies. This form of the disease exhibits a marked tendency to recurrence.

PAGET'S DISEASE.—The peculiar disease of the nipple and areola, described by Sir James Paget,[1] in 1874, and referred to by Thin[2] and Munro,[3] is sometimes mistaken for eczema, but can be distinguished from the latter by its well-defined margin and the presence of deep infiltration in the papillary layer, absence of itching, and the fact that it is nearly always followed by cancer of the breast. Dr. Radcliffe Crocker has met with a very similar condition upon the scrotum and penis. A well-marked patch resembling eczema, but more sharply defined, was excised after having persisted for about eighteen months in spite of a great variety of treatment. The microscopic picture was that of carcinoma, and the disease seemed to originate in the sudoriparous and sebaceous glands and hair-follicles.

Professor Pick, of Prague, has reported a case[4] in which Paget's disease was located upon the glans penis, and Dr. Ravogli described one in which the disease occurred upon the nose. Paget's disease of the nipple occurs in advanced life, generally after the grand climacteric has been passed. It rarely appears before the fortieth year of age.

In a communication made to the Biological Society of Paris in April, 1889, M. Darier attributed the origin of Paget's disease to coccidia or psorosperms, one of the five classes into which, according to Balbiani, the protozoa are divided. This affection of the nipple is therefore regarded as a parasitic affection, a form of cutaneous psorospermosis, generally but not necessarily located upon the nipple. The investigations of Darier have been continued and confirmed by Wickham, Lustgarten, Macallum, and others. The organisms are usually found in the lower layers of the epidermis and in the lactiferous ducts. In other situations they inhabit the ducts of the sudoriparous and sebaceous glands and the sheaths of the hair-follicles. They are often situated near the centre of a mass of flattened epithelial cells. As a rule, they somewhat exceed in size the normal cells of the deeper layers. Coccidia occur in the form of roundish or elongated cells of granular protoplasm and containing one or more nuclei. They develop by surrounding themselves by cysts, the interior of which become filled with spores. The cysts finally rupture, the spores escape, and again generate the roundish and granular coccidia. The cyst-wall has a double contour from which the protoplasm is retracted in places, being attached to the enveloping membrane by ray-like prolongations. Several nucleated bodies may exist within one cyst-wall. These appearances are characteristic. They are, moreover, of practical value, as it has been found feasible to detach scales from the affected surface, and, by a process of mounting and staining, identify the psorosperms. From this doctrine of pathogenesis is deduced a rational treatment for Paget's disease by parasiticidal remedies. The affection is curable in the early stages without a recourse to excision. By other observers the supposed coccidia are regarded as nothing more than degenerated, modified, or cornified epithelial cells. Nevertheless, Darier points out that the bodies which he believes to be coccidia can not be transformed epithelial cells, since in the Malpighian layer, where they are best observed, they are destitute of the prickles normally characteristic of the epithelial cells of the stratum mucosum. As well-illustrated in a case reported[1] by me some years ago, the features of Paget's disease are sufficiently distinctive to separate it from chronic eczema, psoriasis, or molluscum epitheliale. On an average the affection becomes epitheliomatous in from two to six years. Retraction of the nipple is rare in eczema, but is common in Paget's disease. (See also "Dermatitis Coccidiodes.")

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[1] St. Bartholomew's Reports, 1874.

[2] London Lancet, June, 1881.

[3] Glasgow Medical Journal, November, 1881.

[4] Deutsche med. Zeitung, November 5, 1891.

The treatment of eczema of the breasts is similar in many respects to that of the other local varieties of the disease. It is of the utmost advantage to support and protect the parts by compression, in the form of bandages or medicated plasters. If the nipple be involved, it should be protected from irritation by a shield or breastplate. In more severe cases, the withdrawal either for a time, or the definite removal, of the child from the breast may be necessary. Pencilling the parts with silver nitrate, or a saturated solution of zinc chloride or the compound tincture of benzoin, every two or three days, is often attended with good results. In the meantime, the surface may be anointed several times daily with the following:

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| ℞ | Acidi tannici .................... | ℈j. | 1.30 | |
| | Extracti belladonnæ foliorum ..... | gr. x. | 0.60 | |
| | Extracti opii .................... | gr. v. | 0.30 | |
| | Ungt. aquæ rosæ ................. | ℥ss. | 16. | M. |

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[1] Journal of Cutaneous and Genito-Urinary Diseases, May, 1895.

Zinc oleate, camphor, or betanaphthol can be added to the ointment, or diachylon ointment can be employed. Beef-marrow, purified wool-fat, or sheep-suet, alone or with some of the astringent agents, as ergot, kino, geranium, or boric or salicylic acid, will be useful. A solution of phenol-salicylate in ether and flexible collodion has been used with advantage. The oil of cade, resorcin, and pyrogallic acid will at times be serviceable. After the application the nipple should always be washed with either oil or water and soap before the child is put again to the breast; care, however, should be exercised to avoid cleansing the parts too much and aggravating the disease. Dr. Van Allen has found the white of eggs beneficial, painted upon the nipples after the babe has nursed. M. J. Blechmann recommends gold-beater's skin, the nipple first being wet with water, the skin, pierced in the centre by a number of fine holes with a needle, is applied around the nipple, to which it adheres like a second epidermis. The external surface of the protective is moistened before the child takes the breast, and is renewed after each act of nursing.

ECZEMA OF THE UMBILICUS (*Eczema Umbilici*).—The navel, alone or with other parts of the integument, may be affected with eczema. It may take on the inflammatory or pustular form without much swelling, or may project out like a small tumor, being red, infiltrated, moist, dry, or fissured, and occasionally covered with crusts. The course of the disease is thus seen to be very similar to that of eczema of the nipple. Syphilis may here simulate eczema, but ulceration is usually present in the former, with a very offensive odor, and other manifestations of the specific affection. The treatment consists of mild compression, by a bandage or a medicated plaster, with cleanliness and a dusting-powder. Zinc oleate, bismuth subnitrate, or very fine zinc carbonate, will act efficiently. The ointments of zinc, lead, and bismuth, alone or combined with betanaphthol, thymol, or sulphur, are all serviceable.

ECZEMA OF THE FLEXOR SURFACES OF THE JOINTS (*Eczema Articulorum*).—The flexor surfaces of the joints and the adjacent parts are favorite localities for the development of eczematous eruptions. The axillæ, the elbow-joints, the groins, and the popliteal spaces are the regions which are thus attacked by preference. The eruption is usually symmetrical; for example, when one axilla is invaded the other is likewise affected. Again, when eczema is found at the bend of the elbow, the popliteal space also usually suffers; and in the same manner, when the wrists are affected the ankles are also usually involved. The skin upon the region attacked becomes red, infiltrated, and scaly, or raw, and covered with serum and crusts, the epidermis being macerated. Owing to this condition the movements of the affected joint are often painful, consequently it is more or less flexed or bent at an angle. As the disease progresses the infiltration and crusting increase, and fissures of various depths form, from which exude serum or blood. The eruption now often spreads to the neighboring parts, particularly the exterior surfaces, and the limb is held in a fixed position, both flexion and extension being very painful. Eczema involving the regions just described will yield, in the acute and subacute forms, to some of the mild applications already described, and in the chronic condition to preparations that are more stimulating, such as the various mercurial ointments, with or without tar. Care must be taken to protect the parts and to give them support and rest by moderate compression, in the form of a bandage.

ECZEMA INTERTRIGO.—Eczema intertrigo differs only in degree from erythema intertrigo, which is a simple hyperemia; in the former the morbid process passes beyond the latter condition, the surfaces being red, moist, macerated, with marked weeping. Eczema intertrigo is met with in those parts of the body, particularly in fat people, where two portions of the integument come in contact, as the flexor surfaces of the joints, the neck, between and beneath the breasts, in the folds of the skin of the abdomen, and the inner surfaces of the nates. It occurs more frequently during the summer months, and is often occasioned or aggravated by uncleanliness, friction of clothing, tight bands, walking, and driving. The treatment recommended for acute eczema will be sufficient to relieve the majority of cases. Thin films of prepared or medicated cotton, or patent lint, laid between the apposing surfaces, alone or medicated with either a bland ointment or dusting-powder, will rapidly overcome the disease. Thymic acid or phenol may profitably be added to whatever lotion is employed if the discharge becomes fetid. Talcum powder should be freely used.

ECZEMA OF THE GENITAL ORGANS (*Eczema Genitalium*).—Eczema of the genital as well as the perineal and anal regions is far more frequent than is generally thought by the profession. Patients under my observation often state that their trouble was supposed to be simply chafing, or the result of piles, or that shame of exposure has caused them to conceal the disease and apply various home remedies or one of the many advertised nostrums, until, all means being exhausted, they have been driven by necessity to consult a physician. How many, however, who are even more sensitive, go on trying in their own way to obtain relief, and continue for an indefinite time to suffer from perhaps the most distressing of all the local varieties of eczema? Eczema may affect the genital organs alone, or may extend to or from some of the adjacent regions, or may appear simultaneously with the disease in other parts of the body. It occurs in both sexes and at all ages, but is more common during adult life and in declining years; it may be mild or severe, acute or subacute, but exists more commonly in the chronic form. The part affected may be the seat of the papular or vesicular variety, attended with redness, heat, and swelling, but more frequently the erythematous form will be present, with more or less secondary changes. The rich supply of blood-vessels, lymphatics, and nerves of the part fully explains the marked changes and harassing and painful symptoms that follow the appearance of the various lesions. In the male, either or both the penis and scrotum may be affected. The erythematous form usually first involves the penis, in part or over the whole organ, extending sometimes up to the pubes. It generally attacks the transverse folds of the integument upon the dorsal part, appearing as elevated red lines, while on the under surface of the organ the skin may be red and moist. The organ may be more or less swollen, the surface occasionally rough and scaly, and the parts the seat of most distressing itching. Balanitis and phimosis sometimes result in consequence of a thickened condition of the skin of the prepuce. The same variety, the erythematous, may extend from the penis, groins, anus, or perineum to the scrotum, or the disease may appear on the latter and spread to all the adjacent parts. When the scrotum is affected, the skin is red, slightly scaly, and often relaxed, stretching or hanging down to a considerable extent, and by coming in contact with the limbs, develops irritation, frequently causing an extension of the disease. As the affection progresses, the relaxation disappears, the infiltration or thickening increases to a great degree, and the sides of the scrotum are covered with moisture, the parts sometimes becoming absolutely raw or fissured, with occasionally the formation of crusts. The itching, pain, and distressed feeling under such circumstances are intense. The female organs suffer in a like manner. The labia are usually the seat of the disease, but the mons veneris, the lower portion of the abdomen, and the mucous membrane of the vagina may be attacked. In rare instances the disease extends as far as to the neck of the womb. Eczema of the vulva does not usually occur until after the menopause. The adjacent portion of the thighs, and the perineum and anus, may also be involved. The labia, when affected, may be either slightly red and scaly, or severely inflamed, thickened, dry, and hot, or covered with abundant secretion, the apposing surfaces glued together, the discomfort from the itching and pain being at times unendurable. The nervous exhaustion, due to the constant itching and want of sleep, is often so intense as to interfere seriously with the patient's health. The causes that especially excite and aggravate eczema of these parts are the various disturbances of the general system, genital errors and disorders in particular, uncleanliness, and friction of the apposing surfaces, clothing, and the various appliances that are brought in contact with these parts. It may likewise be due to diabetes. The common forms of air-borne bacteria are constantly present, and fermentation adds to the irritating nature of the secretion.

Ring-worm, syphilis, herpes, acne, pediculosis, and paresthesia, occurring upon the genital regions, may be mistaken for eczema. Ring-worm may be recognized by the crescentic border of the patches and the discovery of the parasite; syphilis by the history of infection, the usual absence of pruritus, and the presence of other characteristic features of the disease. Herpes will be known by the preceding burning, smarting, and neuralgic pains, succeeded by the appearance of vesicles in groups, mainly around the mucous outlets; while in eczema of these regions vesicles rarely occur, and when they do, they usually appear upon the cutaneous surface. Acne may occasionally develop in these parts, often from the use of one of the bromides or iodides, but the peculiar features of acne, with the scattered lesions, limited to the glands and adjacent parts, will dispel any doubt as to the diagnosis. In pediculosis the pubic louse can always be detected by close observation. Paresthesia, which may attack the genital organs, and which may give rise to eczema, can be recognized by the history of the case and the absence of lesions of the skin in the beginning of the disorder.

The treatment of eczema of the genital organs, while usually conducted upon the same plan pursued in other parts of the body, requires, in addition, some special consideration. Acute cases can often be better managed by soothing ointments, bland oils, and dusting-powders (especially talcum), little or no water and soap being applied to the surface during the continuance of the eruption. The parts must be kept at rest, all excitement avoided, and the surface protected from the apposing parts and the clothing by thin films of simple or medicated cotton, lint, or old muslin. Light compression, by bandaging with old muslin, both for protection and to give rest and support to the congested and infiltrated integument, is of the greatest value, in both the acute and chronic forms. The scrotum may be supported in a suspensory bandage. Scarification of the scrotum aids absorption of the infiltration. The patient must be instructed to desist from rubbing or scratching the surface. If the torment and suffering becomes very great, and the disease appears on the increase, the patient should be put in the recumbent position, and then, with perfect rest and proper medication, the affection can soon be relieved.

The following is useful in the acute form:

| | | | | |
|---|---|---|---|---|
| ℞ | Hydrarg. chlor. mit. .............. | gr. x. | 0.60 | |
| | Zinci carbonatis ................. | ʒj. | 4. | |
| | Pulveris marantæ ................ | ʒj. | 4. | |
| | Extracti belladonnæ foliorum ...... | ʒss. | 2. | |
| | Extracti opii .................... | gr. x. | 0.60 | |
| | Ungt. aquæ rosæ ................. | ℥j. | 32. | M. |

The calomel can occasionally be omitted, and ten or fifteen grains (0.60 or 1 gm.) of betanaphthol or a drachm (4 gm.) of sulphur substituted in place of it. This ointment, or some of those previously suggested for eczema, can be applied night and morning, and one of the ordinary dusting-powders sprinkled or puffed over the surface. It is well to apply the dusting-powder frequently during the day. Again, it is of advantage occasionally to use an emollient or alkaline bath, to lessen the irritation. Astringent baths of alum, tannin, or sage are also of service. An ointment recommended by Lustgarten is:

| | | | | |
|---|---|---|---|---|
| ℞ | Cocain. oleatis | gr. x-xv. | 0.60 to 1. | |
| | Ol. olivæ | ʒss. | 2. | |
| | Adipis lanæ hydrosi. | ʒiij. | 12. | M. |

Two daily applications are made, and the parts are subsequently dusted with an absorbent powder. In cases attended with free secretion and formation of scabs, warm baths are useful.

In chronic cases, the skin should be cleared off by oil, or, if necessary, water and soap—Castile, sulphur, tannin, and betanaphthol all being useful—every second or third night, and the ointment gently reapplied. The following has likewise been found effective:

| | | | | |
|---|---|---|---|---|
| ℞ | Ungt. hydrarg. nitrat. | ʒiij. | 12. | |
| | Olei anthemidis | ♏ x. | 0.60 | |
| | Betanaphthol | gr. v. | 0.30 | |
| | Zinci carbonatis | ʒj. | 4. | |
| | Ungt. aquæ rosæ | ℥j. | 32. | M. |

The subjoined lotion will be serviceable:

| | | | | |
|---|---|---|---|---|
| ℞ | Liquor calcis | f℥iij. | 96. | |
| | Extracti belladonnæ foliorum | ʒj. | 4. | |
| | Glycerini | f℥iij. | 96. | M. |

Lotions of tannic or gallic acid, or the extract of kino, are also beneficial. Phenol and the tarry preparations can likewise be used in the form of an ointment, and the diachylon ointment is also sometimes of value. The application of a strong solution of nitrate of silver is useful in stubborn cases, particularly if fissures be present. In some, the tincture of benzoin is of service. The employment, in obstinate cases, of the alkaline or acid baths, or liquid medicated baths of potassium sulphide or sodium salicylate, will often give great relief. Vaginal suppositories containing morphine and cocaine are indicated when the vulva and vagina are the seat of disease. Galvanism and faradism may also be applied in order to relieve infiltration. Eczema of the penis, especially the glans, is often symptomatic of diabetes mellitus. The urine should be examined, and if sugar be present the appropriate regimen and treatment should be adopted. Locally, scrupulous cleanliness, and the use of weak solution of phenol, or chloral, with the use of an antiseptic powder, is required.

Eczema of the Anus and Anal Region.—Eczema is often limited to the anus (*Eczema Ani*), or it may extend between the nates, in the cleft over the perineum back of the genital organs, or down the inner surface of the thighs. In the involvement of the anus alone there may be a slight muco-cutaneous congestion, with the most distressing itching, burning, or painful sensation up even into the mucous membrane of the rectum, or the parts may be red, swollen, and infiltrated. The surface may, or may not, pour forth a fluid exudation, which dries into crusts over the affected region. Fissures frequently form, which are exceedingly painful in walking, sitting, and especially during each movement of the bowels. In exceptional cases the intensity of the inflammation may even excite the growth of vegetations. Again, it may cause inflammation of the rectum with a discharge of mucus, pus, and blood. The violent itching, burning, and painful sensations usually increase during and after defecation and toward night, especially after the patient has retired to bed. The parts are strained by the tenesmus, picked and torn in the effort to get relief, so much so that the muco-cutaneous surface is frequently edematous, hypertrophied, and at times partial prolapsus ani may follow. The affections with which this variety is liable to be mistaken, especially paresthesia, have been discussed under eczema of the genital regions, and the distinguishing points there considered. The treatment suggested for eczema of the nose, lips, and genital organs will be equally effective for the eruption involving this region. Too much stress, however, can not be laid upon the value of the various medicated suppositories for relieving and curing eczema of the anus. The ointment of the oleate of silver is a remedy of particular value in this localization of eczema, as well as when the disease involves the external genitals. Opium, belladonna, and hyoscyamus may be appropriately added. (Regarding the use of the oleates in eczema, see the author's volume, "Ointments and Oleates, especially in Diseases of the Skin," 1890; second edition.)

Eczema of the Legs (*Eczema Crurum*).—The legs of both sexes, more particularly in middle and advanced years, may be attacked by any one of the forms of eczema. The extent and severity of the eruption will vary according to the cause, the condition of the health, and the occurrence of such complications as varicose veins. Eczema of the legs usually first shows itself on one or both members as the erythematous or vesicular variety, generally being limited to these parts, and running through an acute course into the inflammatory form. Sometimes it appears as one or more patches of various sizes, generally upon the front of the limb or on the ankle, which often coalesce until the whole member is involved. The majority of cases, however, that present themselves for treatment have become chronic, the surface being red, thickened, and more or less covered with yellowish or brownish crusts and scales of variable sizes, between which may be seen a clear, purulent, or bloody exudation. On removing the crusts and scales, the exposed surface will be found to be denuded of epidermis, reddened, moist, and weeping. In others, the legs may be the seat of one or more large or small red, infiltrated, dry, and scaly patches. The inflammatory process gives rise usually to the most intolerable itching, and the scratching which the patient will often resort to, sometimes during sleep or in a state of semi-consciousness, always aggravates the eruption. Eczema of the legs is frequently the result of varicose veins, and is thus not only associated with them, but is further complicated by ulcers and other changes which they produce. In old cases the thickened skin may assume a papillomatous appearance and simulate elephantiasis. The diagnosis is usually plain. Syphilitic ulcers of the legs may be distinguished from varicose ulcers by their sharp-cut edge, somewhat undermined, filled with abundant fetid pus, and being usually situated on the posterior part of the legs. On the other hand, varicose ulcers are everted and hard on the edge, the secretion is scant, often without odor, they are very vascular, and usually appear on the front or sides of the limbs. Further, it must be remembered that this disease sometimes accompanies elephantiasis Arabum, but that the eczematous eruption is secondary to the development of the latter affection.

The treatment will not differ from that suggested for the disease in other regions, except in the use of compression, which here becomes almost a necessity, in order to give support to the relaxed vessels and tissues. In beginning the treatment in both the acute and chronic forms, I first try to place the patient, if possible, in the recumbent position. It is often impossible to have patients submit to this procedure, but in some of the more obstinate cases it is absolutely essential for the relief or cure of the disease. The parts in the acute variety should be bathed once or twice daily with an alkaline or emollient bath, and the surface covered with the following ointment:

| | | | |
|---|---|---|---|
| ℞ Hydrarg. ammonati | ℈j. | 1.30 | |
| Creosoti | ♏ v. | 0.30 | |
| Ungt. zinci oxidi | ℥j. | 32. | M. |

In place of this combination, four drachms (16 gm.) each of lead and zinc carbonate, with four ounces (128 gm.) of sweet-oil, may be employed. An emollient powder can next be dusted over the surface, and a soft muslin bandage applied to retain the dressing, protect the parts, soothe muscular irritation, tone up the dilated capillaries, remove poured-out products, and prevent the escape of serum into the tissues. Chronic eczema of these parts, on the other hand, demands more stimulating treatment; the surface should be washed occasionally with sulphur, tar, or betanaphthol soap, and hot alkaline and astringent baths employed every day or two, unless contra-indicated. The following is useful:

| | | | |
|---|---|---|---|
| ℞ Ungt. hydrarg. nit. | ʒij. | 8. | |
| Sulphuris sublimati | ℈j. | 1.30 | |
| Zinci oxidi | ʒj. | 4. | |
| Olei anthemidis | ♏ x. | 0.60 | |
| Adipis recentis | ℥j. | 32. | M. |

If ulcers exist, either bismuth subnitrate, bismuth subiodide, pulverized red cinchona bark, or some other astringent powder can be sprinkled over the surface. Phenol, salicylic acid, or balsam of Peru, camphor, or the oil of cade, or any of the tarry preparations, can be employed with benefit. Diachylon ointment is also useful, either alone or combined with other agents. Compression, by means of muslin, simple or compound medicinal plaster, or the rubber bandage, is a most valuable adjuvant in the cure, by affording support, rest, and protection to the parts.

Eczema of the Hands and Feet (*Eczema Manuum et Pedum*).—The hands and feet may be the seat of all the varieties and changes found elsewhere in eczema. The hands, by reason of their exposure, especially in the various occupations, are more frequently affected than the feet. One or both hands may be the seat of the disease—more frequently the latter is the case—and occasionally, though rarely, the feet may be involved at the same time. Eczema may manifest itself on the hands with more or less inflammation, vesiculation, papulation, and pustulation, with a slight or large amount of swelling. It more frequently appears as the subacute or chronic variety, characterized by the continued development of groups of vesicles and papules on the back of the hands and sides of the fingers, or on the soles and palms, the vesicles remaining long on these parts, or the serum burrowing beneath the infiltrated patches. The surface may become the seat of superficial or deep fissures, especially about the knuckles and upon the palms. The thickness of the epidermis of the palms of the hands, as well as the soles of the feet, not only occasions these fissures of various lengths and depths to form, but also leads to more or less infiltration, hardening, and peeling of the skin as far forward as the ends of the fingers and toes. One or both palms, or soles may be affected, and the entire or part of the surface may be involved. The itching, pain, and suffering from this fissured skin, which may be inelastic or excessively dry, or exude serum or blood, are usually so great as to render all motion exceedingly painful, and in some cases impossible. Eczema occurring between the toes is a most troublesome affection, owing to their constant action, contact, and the friction between the apposing surfaces, the retention and decomposition of the perspiration acting as an irritant, producing great itching, pain, and maceration of the epidermis. Eczema of the fingers and toes may, by its action on the matrices, affect the nails of one or all the members.

*Eczema Unguium.*—In this form of the disease the skin around the base or at the sides of the nail is usually either red, thickened, or abraded, while the nail itself is somewhat depressed at the root, lacks polish and smoothness, and is rough and uneven. In some cases the nail becomes very brittle, in others thin, and at times it assumes a worm-eaten or club-shaped appearance. The nail may remain for a time in this condition, occasionally being broken and cast off, to be again replaced, but in most instances ultimately regaining its natural aspect by degrees with the disappearance of the disease.

Eczema, wherever located, not uncommonly induces nutritive changes of a general character in the nails. This condition, however, can not be properly termed eczema of the nails. Eczema may attack the nails as a primary or secondary affection. In most cases the disease is an extension from eczema of the hands or fingers. Isolated eczema unguium is met with in two forms: (1) Perionychial eczema, with subacute ungual lesions. The integument surrounding the nail is red, swollen, and humid, the nail becomes eroded and deformed and may be shed, leaving exposed a rough, red, and thickened bed. (2) Ungual eczema or dry eczema of the nails. In this form there is no redness or discharge. The nail becomes rough and thickened, and in some cases arched like the roof of a house. Longitudinal fissures or transverse grooves, little pits arranged longitudinally, partial or general exfoliation of the nail, are among the observed phenomena. In other words, the evidences are those of profoundly depressed nutrition, but are not distinctive unless taken in connection with the actual presence of eczema in other portions of the body or a history of preceding attacks. Caldwell has described[1] a peculiar affection of the nails in an individual who had previously had attacks of eczema, and periodical copious deposits of urates. There was enormous hypertrophy of the bed of the nails, with the production of hard, scaly, mortar-like material, which raised the nail sometimes to a right angle with the axis of the finger and caused it to break off short. The four extremities were attacked, but in all some nails escaped.

Eczema of the hands and feet may resemble syphilis, psoriasis, and scabies. In syphilis the lesions are smaller and more isolated than in eczema. They are also deeper, the edges ragged, with adherent dirty, gray scales, the surface beneath being of a red or coppery hue. Syphilis will not usually extend to the dorsal surface of the hands and feet, and is not attended with itching. Occasionally the two diseases exist side by side; the history, the appearance of the eruption, and the presence of syphilitic lesions on other portions of the body will, by a little care, demonstrate the points of difference. Psoriasis of these parts is, as a rule, accompanied by patches in other regions, the fissures are generally dry, and the scales large, white, and abundant. In eczema, on the other hand, the cracks exhibit more or less moisture, and the scales are scanty and of a yellowish hue. Finally, scabies, which involves especially the hands, may be detected by the furrows, the itch-mite, the contagious nature, or by its rapid yielding to antiparasitic remedies.

The treatment of this variety of eczema can be briefly summed up:

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[1] British Medical Journal, May 10, 1890.

Rest, and the application of an emollient or stimulating ointment. The frequent use of water, or water and soap, should be interdicted, as cases are often thus aggravated. The parts may occasionally with advantage be cleansed and stimulated with sapo viridis, or one of the medicated soaps, but the interval between such applications should usually be long. It is better, in the majority of cases, to use a bland oil for softening the surface and removing all effete products from the parts. Dusting-powders, or one of the oils, or a mild stimulating ointment, may then be used if the individual must continue at his usual occupation. I prescribe very often, in the acute form, rose-water ointment, with half a drachm (2 gm.) of sulphur, and one or two drachms (4 to 8 gm.) each of lead and zinc carbonate. Codliver oil, alone or combined with a few drachms of oil of cade, is beneficial in both the subacute and chronic forms. In the chronic variety the following will be of service:

| | | | | |
|---|---|---|---|---|
| ℞ | Ungt. hydrarg. nitratis | ℥ss. | 16. | |
| | Olei cadini | fʒj. | 4. | |
| | Adipis recentis | ℥ss. | 16. | M. |

Another good application is:

| | | | | |
|---|---|---|---|---|
| ℞ | Ungt. hydrarg. oleatis (10 to 20 per cent.) | ℥ss. | 16. | |
| | Betanaphthol | ʒss. | 2. | |
| | Adipis recentis | ℥ss. | 16. | M. |

An ointment of ammoniated mercury has also been successfully employed. In the involvement of the fingers and toes, ointment of zinc oleate—one or two drachms (4 to 8 gm.) to the ounce (32 gm.) of lard—is useful. It can be applied on muslin or lint, placed between the members, and confined by a bandage. An ointment of resorcin, fifteen to thirty (1 to 2 gm.) grains to the ounce (32 gm.), is likewise a valuable application. In subacute or chronic eczema affecting the back of the hand, Jamieson esteems Lassar's paste, which he looks upon almost as a specific. It is not adapted to use on the palm on account of the absence of sebaceous glands in that situation. Lassar's paste is prepared according to the following formula:

| | | | |
|---|---|---|---|
| ℞ | Acid. salicylic | gr. x. | 0.60 |
| | Zinci oxidi | ʒij. | 8. |
| | Pulv. amyli | ʒij. | 8. |
| | Petrolati opt. | ℥ss. | 16. |

M. Fiat pasta.

If the nails are affected ointment of tin oleate will assist in relieving the irritation and restoring polish. Salicylic acid, in an alcoholic lotion, ointment, or plaster, is also useful when eczema involves the nails. Sabouraud recommends applying every day upon a piece of absorbent cotton a solution of fifteen grains (1 gm.) of iodine and thirty grains (2 gm.) of potassium iodide in a litre (1¾ pints) of water. Compression is as efficacious in eczema, particularly the chronic form, of these parts, as in the legs and other portions of the body. The entire or part of the hands or feet or each finger and toe can be covered with the medicament, and then bandaged with muslin, or a medicated plaster of zinc, lead, etc., can be used. Tightly-fitting porous stockings applied over the dressing, or a stocking woven with some gum material, may also be employed. The hands, in a like manner, can be covered with cotton gloves, or, what is much better, a woven glove, with cotton and gum in the fabric.

Eczema sometimes invades mucous membranes. As a rule, the disease extends from a contiguous portion of the skin. From the eyelid it may spread to the conjunctiva, from the external to the internal surface of the nose, from the vulva to the vagina and cervix uteri, and from the anus into the rectum. Exceptionally, it is met with on the tongue as a solitary manifestation. The mucous membranes, when attacked, are red, swollen, and painful. Small vesicles or ulcerations may be perceived upon their surfaces.

**Prognosis.**—Eczema is a curable disease, if properly managed. In very many instances, however, either the hygienic, dietetic, constitutional, or local treatment ordered will be so neglected, changed, or modified by the patient as to prolong the eruption, and often interfere materially with its cure. The prognosis, therefore, largely depends upon the patient following in every respect the directions of his medical adviser. An opinion as to the probable duration of the disease depends upon the exciting cause, the variety and stage of the eruption, whether acute or chronic, the locality invaded, and the length of time the affection has been upon the surface. Thus, when eczema is dependent upon old cases of nervous debility, dyspepsia, chronic ovarian or uterine disorders, the cutaneous inflammation may remain obstinate or rebellious until one or another of these conditions that may be present is removed. Every case must be thoroughly investigated, so as to ascertain, if possible, the exciting cause, and the prognosis based upon the removal of the condition that produced the disease. It is also essential, before expressing an opinion, to take into consideration whether the disease be acute or chronic, as well as its variety and stage; for instance, the result of treatment is much more rapid and certain in acute than in chronic eczema. Again, acute vesicular eczema has a shorter and more definite course than papular eczema, which tends to become chronic. Finally, the duration of the eruption, whether it is the first onset of the disease or a relapse, and the region invaded, are points of the utmost importance in giving an opinion. Acute eruptions of short duration, properly managed, may quickly disappear, or return once or twice and then vanish, but relapses usually denote a long and tedious course of the disease. The prognosis also depends upon the locality invaded; eczema of the scalp, beard, and other hairy parts, for example, are invariably both obstinate and chronic.

Eczema of the hands and feet is generally unyielding on account of the constant exposure of the hands, and the necessary activity of the feet, in the patient's daily employment. Other examples of rebellious and persistent eczema are observed when the disease attacks the scrotum and adjoining parts, and the limbs of old persons. In the involvement of the former portion of the economy, the apposition of surrounding parts, their anatomical formation, and in the latter the presence of varicose veins or ulcers, tend to complicate the disease and render it for a long time unyielding, even under the most careful treatment.

## LICHEN RUBER.

VARIETIES.—Lichen ruber acuminatus—Lichen ruber planus.

Lichen ruber is an inflammatory cutaneous affection, characterized by small acuminate or flat, reddish, umbilicated papules which may coalesce into patches, and which pursue a more or less chronic course; but finally terminate in resolution, and are followed usually by pigmentation of the surface.

**Symptoms.**—Galen's definition of lichen, "Summæ cutis asperitas cum multa prurigine, squamis et furfuribus," omits the characteristic clinical feature properly expressed by the title "ruber," which is generally appended, at the present day, to the name of the disease. Erasmus Wilson contributed, from his great clinical experience, many valuable observations upon lichen ruber; but it is to Hebra that we owe its first identification as a separate and distinct disease.

At least two varieties or clinical forms of this disease may be recognized and these are designated by the titles "planus" and "acuminatus." Lichen scrofulosis will receive separate consideration later. The two forms mentioned differ in the intensity of the accompanying symptoms, in the appearance of the lesion, and in their locality and course; but they are essentially the same, and may occasionally be found associated in the same individual. The idiosyncrasies of patients, and the general state of health, especially as regards other diseases causing cachexia, or depressed states of nutrition, largely influence the character, course and curability of lichen. In some cases the disease may be more acute in character, and in such exceptional instances, the eruption is preceded by fever (Unna) and muscular pains. When the eruption is general and covers the body it is usually followed by a fatal result.

LICHEN RUBER PLANUS has no premonitory symptoms. It is symmetrical, and consists at first of a variable number of minute red papules, about the size of a mustard-seed, accompanied by more or less itching, which is apt to be worse at night. In certain cases, paroxysms of intense itching have been observed to occur periodically every afternoon. The lesions may appear upon any part, but are most frequent upon the anterior surface of the forearms and the tibial surface of the legs, and seldom occur upon the palms or soles. They rarely, if ever, develop upon the face, but have been observed upon the tongue and mucous membrane of the mouth and fauces. Bulkley has seen them appear primarily on the glans penis. The lesions attain their full development in a few days, and may increase in size from a pin's-head to a split pea. They are then quadrilateral or irregularly rounded, slightly elevated above the surface, from which they rise abruptly, dark-red, umbilicated, and not surrounded by an inflammatory areola, firm to the touch, but not painful. Their surfaces are usually smooth, but may become the seat of slight furfuraceous desquamation. According to Louis Wickham, striæ and grayish points can be detected upon the top of the older papules, and are more marked when the papules coalesce into patches. He regards these peculiarities, when present, as pathognomonic. The papules may be isolated and disseminated over a wide area, but generally manifest a tendency to form groups or bands of various sizes. In some instances they exhibit a linear arrangement, or follow the course of certain cutaneous nerves. They remain discrete, generally, and do not usually form large patches. Individual papules pursue an independent course of development, some attaining greater size or persisting longer than their fellows. The course of the eruption varies. It may subside spontaneously in a few weeks, or it may remain for an indefinite period. Fresh lesions occur from time to time. When the papules finally disappear, marked pigmentation of the epidermis is seen at their site. This pigmentation may finally fade and the normal appearance of the skin be regained. In some cases, however, atrophic spots or patches may follow. In others more or less desquamation may also be observed, but neither vesiculation nor pustulation occurs as the rule unless infection takes place owing to scratching with the nails. The epiderm covering the papules sometimes becomes markedly thickened. This result mainly follows in regions where the cuticle is normally thick, as upon the knees, elbows, etc., but is not restricted to those localities. The intervening skin remains normal in structure and appearance throughout the course of the disease. The nails are rarely if ever involved.

**Diagnosis.**—The only affections which present any resemblance to lichen ruber planus are lichen ruber acuminatus, lichen scrofulosus, acne, papular eczema, psoriasis, and the papular syphilide. The papules of *lichen ruber acuminatus* however, are rounded and acuminated, and accompanied by intense itching; those of lichen planus are quadrilateral, flattened, and umbilicated, with a variable amount of itching. The intervening skin remains normal, and the general health is unaffected. In *lichen scrofulosus* the papules are reddish-yellow in color, and are situated around the hair-follicles. They are only observed in persons of the scrofulous diathesis, and rarely occur after the twenty-fifth year. The papules of lichen ruber planus are dark-red in color, and are developed around the orifices of the sudoriparous glands. The papules of acne usually appear first on the face; they are large in size, are inflamed, and frequently become pustular. They are not attended by itching. In *papular eczema* the papules are arranged in groups, but they are seated upon an inflamed surface, and severe itching and more or less vesiculation and desquamation follow. Some cases of *psoriasis* may, in their early stages, present a slight resemblance to lichen planus, but the development of the characteristic mother-of-pearl scales will make the diagnosis certain. The papules of *syphilis* are developed in groups, but their large size, coppery color, and extensive distribution, and the presence of other symptoms of the disease, will prevent any diagnostic error.

LICHEN RUBER ACUMINATUS, which was formerly called pityriasis rubra pilaris by some authors, has for its characteristic features the simultaneous appearance of a number of hard, dry papules corresponding in situation with the hair-follicles. These lesions may be pink, red, or pale-orange in color. They are small, about the size of a pin head; but large patches may also occur (constituting in fact, lichen ruber planus). The papules are usually seen most abundantly affecting the back of the hands and wrists; and may also appear on the phalanges, forearms, elbows and knees, and even on the trunk. The palms of the hands and the soles of the feet may be first attacked, and may desquamate. The eruption, in rare cases, extends over the whole body, the surface becoming very dry, itching and scaly.

When examined closely with a lens, an atrophied hair may frequently be seen in the centre of the lesion. A horny sheath surrounds the root of the hair, penetrates the follicle and protrudes, making a horny elevation. The plug may be taken out from the dilated follicle leaving a gaping orifice. It is produced by excessive cornification of the epithelial wall of the hair-follicle, followed by secondary inflammatory or degenerative dermal changes.

According to the views of Unna this process may also begin in a sweat-follicle as well as a hair-follicle, or independently of either. He also recognizes a tendency to general hyperkeratosis of the surface. This is observed particularly in the scaliness of the palms of the hands and soles of the feet.

**Clinical Symptoms.**—The acuminate form is rare as compared with the diffuse or aggregate form next to be considered. The differential diagnosis of lichen ruber acuminatus in discrete cases with few lesions is easy. The presence of the horny, almost thorny, projections from the follicles, and the atrophied hair in the centre of some of the lesions, the general dryness or scaliness of the surface, especially of the hands and feet, and the absence of any obvious attendant symptoms either general or local, distinguish it from ordinary forms of acute or chronic dermatitis.

In the severer forms, however, inflammatory processes occur which are found also in chronic forms of dermatitis, as in prurigo. In this variety also the course may be more rapid and be attended by general symptoms, such as fever and rheumatic pains, and decided deterioration of the general health. This form, as observed by Van Harlingen, resembles pityriasis rubra, and psoriasis. The papules of lichen ruber acuminatus bear small horny scales, which are slightly polished or shining, upon their apices, when the light is properly reflected. After the first development of the eruption, the papules do not enlarge nor do they become converted into vesicles or pustules. The eruption is usually accompanied by intense itching; but in some exceptional cases this is not very marked. Secondary inflammatory lesions may be produced by scratching, and the skin may become much thickened and like leather. The papules may continue to form under the superficial layers of the cuticle; but they cannot be seen on account of the increased thickness of the skin. This condition may extend over a large portion of the body. In severe cases, fresh papules develop upon other regions, until, finally, the entire surface of the body, is covered by them and presents a uniformly reddened, infiltrated, and furfuraceous appearance. As the morbid process continues, the infiltration of the skin becomes so great in some cases as to interfere with its natural flexibility, and painful fissures are formed near the joints and folds of the body. The skin of the face and neck is fissured, brittle, and scaly, the eyelids droop, and the lips are thickened and indurated. The skin of the palms and soles becomes thickened and infiltrated, so that painful rhagades are formed and walking is productive of intense suffering. The hairs and nails become brittle and thin, and finally fall out. In other instances the nails are thickened, of a dull yellowish color, and marked by longitudinal ridges. The itching is frequently almost unbearable. The lessened elasticity and increased thickness of the skin tends to cause deformities of the features, and to limit the mobility of the joints. The general health progressively deteriorates until death occurs from both mental and physical exhaustion.

There is a feature about the arrangement of the papules of lichen ruber acuminatus when they first appear, which is peculiar and has diagnostic value. The lesions, which are separated at first, soon show an arrangement in lines, or circles; or the spaces between subsequently become completely filled by papules, until a continuous patch is formed. These lesions follow the distribution of certain cutaneous nerves, to a greater or less extent; exceptionally, they appear almost simultaneously in all portions of the body, but especially on the arms and legs. The parts first affected are frequently the palms and the soles, and this is followed by scaling of the epidermis.

In lichen ruber planus the location of the lesions is not determined by the hair-follicles according to Robinson and others who have shown that the disease process has its special localization, not at the hair-follicles, but usually in the upper part of the corium around the sweat ducts. The rete and the horny layer are thickened and the papillæ are enlarged, their vessels showing dilatation. The sweat glands themselves, however, are not affected. In very recent lesions, the corium is found to be slightly thinned. When a depression exists, it usually corresponds to the orifice of the sweat ducts.

**Symptoms.**—The lesions of lichen ruber planus are papules which are quadrangular or polyhedral in form. They vary in size from that of a pin head to a split pea, and show a decided tendency to coalesce into irregularly-shaped patches. The lesions are not surrounded by an areola; but the edges rise abruptly from healthy skin. The lesions are slightly elevated above the surrounding skin, and the patches may be a line or more above the surface. The papules are seldom round, are of irregular outline, and are flattened on the surface, or may show a small depression corresponding with the orifice of a duct. Ordinarily, the lesions are smooth to the touch, have a glazed appearance, and of a dark-red or even violet color. There are no scales usually; but exceptionally desquamation may occur as a sequel, or complication.

The lesions usually give rise to much annoyance by itchiness. The patches are usually discrete and are found on the flexor surface of the wrists, and the forearms, on the palms and soles, on the penis, rarely in the mouth on the tongue. The course of the disease is slow and the eruption may appear in crops. After the spots undergo involution, their locality is marked by persistent dark-brown, violaceous or slate-colored stain due to deposit of pigment. In rare cases, alongside of characteristic flat-topped, angular lesions, there are a varying number of blebs of small size (bullous lichen planus). These occur even when no arsenic has been given. Whitfield reported 17 cases, of which 9 had had no arsenic. Hartzell[1] suggests that they may arise from traumatism by the finger-nails in scratching.

**Etiology.**—Patients suffering with lichen ruber planus are generally in poor health, due to gout, rheumatism, tuberculosis, or other systemic diseases, or to overwork, depression and debility. The cause of the eruption has not been definitely ascertained. It attacks male and female, but is apt to be more severe and rebellious in women. It is most frequently observed between the twentieth and fortieth years. According to my experience, it is almost invariably associated with evidence of general debility. Improper or insufficient food, nervous depression, and mental anxiety are probably the chief causes in its production. Dr. C. P.

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[1] Journal of the American Medical Association, July 20, 1907.

Russell, of Utica, N. Y., reports in the "Journal of Cutaneous and Genito-Urinary Diseases" for June, 1889, a case in which lichen planus invaded the forearm and arm of a man in whom four fingers of the corresponding hand had been partially amputated on account of injury. The reporter quotes a few other cases in which the evolution of lichen planus seemed to depend upon the condition of some portion of the nervous system and it is probable that the peripheral nerves are involved. It sometimes occurs in persons of rheumatic or gouty tendency.

**Treatment.**—This should be both constitutional and local. Exercise in the open air is essential. The diet should consist principally of beef, milk, eggs, and fruit. In the gouty, rheumatic, or lithemic cases, due regulation of the diet is important. The condition of the alimentary canal is to be carefully ascertained. If any digestive disturbances exist they must be remedied. If constipation be present, it must be removed. If there are evidences of general debility, gentian, serpentaria, coptis trifolia, and quinine may be given with advantage before, and iron and nux vomica after, meals. The treatment which, in my judgment, promises best results consists in the early and persistent administration of tonic and alterative medicines. Iron, quinine, and codliver oil will be found serviceable in all cases. Benefit can also be derived from the use of the chalybeate mineral waters. The most valuable remedy, however, and one which experience has shown to be almost a specific, if administered during the early stages of the disease, is arsenic. It should be given continuously and in gradually increasing doses until some effect is produced upon the eruption, or the point of toleration is reached. The dose should then be lessened, or its administration suspended for a short time, and again resumed until the eruption has entirely disappeared. The drug may be given in the form of solution of arsenite of potassium, commencing with five-minim doses and gradually increasing until twenty minims or more are taken after each meal, or from three to six of the Asiatic pills may be administered daily. If the arsenic is not well borne by the stomach, much benefit can be obtained from its hypodermic administration. Kobner, who originally employed arsenic in this manner in lichen ruber, commences with one to two minims of solution of arsenite of potassium, diluted with an equal quantity of water, and gradually increases the dose. In cases arising from nervous depression or mental fatigue, great benefit will be derived from the administration of one drachm (4 gm.) of the fluid extract of erythroxylon coca half an hour before, and one drachm (4 gm.) of the following combination half an hour after, meals:

| | | |
|---|---|---|
| ℞ Liq. potassii arsenitis | fʒj. | 4. |
| Tinct. nucis vomicæ | fʒss. | 2. |
| Acidi phosphoric dilut. | fʒij. | 8. |
| Syr. simp. | f℥ij. | 64. M. |

Köbner, Besnier, and others have practised, with good results, hypodermic injections of arsenical solutions. Hydrotherapy in the form of douches has been used with asserted advantage. In rebellious cases, Quinquaud sends his patients to mountain resorts. In cases accompanied by marked anemia, rapid improvement results from the administration of ten minims of the tincture of the chloride of iron before, and seven to fifteen grains (0.5 to 1 gm.) of chlorate of potassium after, meals. Dr. Radcliffe Crocker, "Clinical Journal," in a lecture delivered June 20, 1906, at University College, London, stated that he had found three or five grains of thymol in an ounce of olive oil of great benefit for rubbing or pressing into the lesions. Internally he thought that salicin in an effervescing potash mixture was useful, with or without a few grains of quinine. The mineral acids with tincture of nux vomica acted well in those cases in which there was general debility from overwork or worry, this combination having been suggested by the late Tilbury Fox. Codliver oil and the extract of malt are also valuable in debilitated cases. Itching may often be relieved, according to Blaschko, by the internal use of antipyrin. The tincture of belladonna, valerianate of ammonium, and phenol are also recommended for this symptom. Robinson has good results from the use of acetate of potassium with spirit of nitrous ether. Dr. M. B. Hartzell[1] reports good results from salicylic acid, salol and sodium. He recommends the salicylate especially, where arsenic disagrees.

Locally the best results can be obtained in the early stages of the disease from the use of Unna's phenol-sublimate-zinc ointment. This preparation consists of corrosive sublimate, one grain (0.06 gm.); phenol, twenty grains (1.30 gm.); and ordinary oxide-of-zinc ointment, one ounce (32 gm.). It will also be found valuable as an antipruritic in the advanced stages. Phenol lotion composed of phenol, one drachm (4 gm.); alcohol, two drachms (8 gm.); and water, one pint (512 gm.), may also be used to allay the itching, which is sometimes severe. Warm alkaline baths are highly esteemed by Dr. R. W. Taylor, as they allay itching, remove dead epidermis, and promote absorption. He advises also brisk friction every day with the compound tincture of green soap two or three hours before the bath is taken, and, if practicable, a mild friction after the bath should be made and the skin then left unwashed. This writer considers it very important that the skin should be kept well anointed. Wherever the epidermis is much thickened, and especially if it be fissured, he recommends the application of an ointment composed of balsam of Peru, one drachm (4 gm.), and diachylon ointment, one ounce (32 gm.), covered by a roller bandage. If the eruption consists of a few scattered papules, no local measures will be necessary, except to avoid the use of irritating under-clothing. When the papules are numerous and grouped, and accompanied by more or less itching, various soothing lotions or ointments may be locally employed, or the surface covered with a saturated solution of the bicarbonate of sodium.

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[1] Journal of the American Medical Association, July 20, 1907.

A ten-per-cent. solution of chrysarobin-traumaticin, applied with a brush twice weekly, is recommended by Herxheimer. Bran-baths to which vinegar has been added, inunction with glycerole of starch or glycerin containing tartaric acid, are recommended as useful external treatment by Vidal and Brocq. A corrosive sublimate wash, or the emplastrum de Vigo of the French, may also be employed with advantage. A two- to four-per-cent. solution of ichthyol in water has also been employed. In obstinate cases Unna advises the application of diachylon-ointment containing phenol in a proportion as high, perhaps, as four per cent. To this mixture corrosive sublimate is to be added in quantities gradually increasing from two grains (0.12 gm.) to the ounce (32 gm.)

In severe cases, alkaline baths, friction with the compound tincture of green soap, and the application of tarry ointments, are also advised by Dr. R. W. Taylor. In gouty cases, irritating soap and tar preparations may complicate the case by inducing an erythema or eczema, which may be general.

**Prognosis.**—The prognosis in the discrete form of lichen ruber acuminatus, is always favorable. The eruption is not usually accompanied by any constitutional symptoms, and while it may occasionally manifest a disposition to linger, it eventually becomes amenable to treatment and disappears. More or less pigmentation remains for a long time at the site of the eruption, but finally the epidermis resumes its normal color.

In the diffuse form affecting a large surface of the body, if treatment is begun early and perseveringly continued, a favorable result will probably be obtained, but a guarded prognosis should always be given. Many cases terminate fatally notwithstanding all treatment, and those which have lasted for several months before remedial measures are instituted usually pursue an unfavorable course. The prognosis is influenced principally by the general condition of the patient as well as by the extent of the eruption. Patients on whom the lesions are few in number and localized are more amenable to treatment than those on whom they are numerous and diffused over the entire surface.

## LICHEN SCROFULOSUS.

Lichen scrofulosus is a chronic inflammatory cutaneous disease, attacking persons of a scrofulous diathesis, and characterized by the formation of a number of minute papules, which are situated around and over the hair-follicles.

**Symptoms.**—The eruption of lichen scrofulosus consists of a number of small papules; in size ranging from a mustard-seed to a small pea.

They vary in color from pale red to yellow, or reddish-brown. They are firm to the touch, and are slightly elevated above the surrounding surface. The lesions are observed most frequently upon the thorax and abdomen, but may occur upon the back, the extremities, the face, the scalp, or any other region of the body. They are usually developed in groups, which occasionally coalesce and form large, irregular patches. The apex of each papule is covered with a small whitish scale. The eruption pursues a chronic course. The papules first developed gradually disappear by absorption and desquamation, but are followed by a second crop. These in turn become absorbed and are succeeded by others. Finally, the morbid process ceases, the existing lesions disappear, and recovery ensues. The papules do not itch, and are not accompanied by subjective symptoms; but the presence of the scrofulous diathesis is usually manifested by enlargement of the cervical or axillary glands, or other significant signs. More or less discoloration of the general surface may also exist.

**Diagnosis.**—The lesions of lichen scrofulosus resemble somewhat those of lichen ruber, keratosis pilaris, papular eczema, and the small papular syphilide. In *lichen ruber* the papules are bright-red, however, and gradually involve the whole surface, but do not manifest any tendency toward grouping. In *keratosis pilaris* the papules are gray in color, and are generally confined to the extremities. They are formed exclusively of epidermic scales, and are not developed in groups. The papules of *eczema* are irregular in size, bright-red, and usually limited to one area. They are complicated by the formation of vesicles, and are accompanied by severe itching and burning sensations. They run an acute course. The papules of *syphilis* are dark-red or reddish-brown in color, and irregular in size. They are widely distributed, and are attended by other symptoms of the disease.

**Pathology.**—The pathology of lichen scrofulosus has been studied by Kaposi. The papules are produced by exudation and cell-infiltration into the hair-follicles and sebaceous glands, and the tissues which immediately surround them. The morbid process begins around the blood-vessels and in the connective tissue at the base of the hair-follicles. The cells finally penetrate into the cavities of the follicles and the glands, distending them to elevate the epidermis and produce the characteristic papules. The lesions may disappear by absorption, or by superficial ulceration and the formation of minute cicatrices.

**Etiology.**—Lichen scrofulosus is rarely met with in the United States. It appears to be more common in males, and is usually encountered about the age of puberty. It may, however, appear at any age. It is probably due indirectly to the scrofulous diathesis, but its immediate exciting cause is not known. In many of the reported cases the eruption has coexisted with or preceded tubercular lesions in the lungs or other organs. Jacobi, of Freiberg, refers to a case in which lichen scrofulosus occurred in a woman who was subsequently attacked by lupus of the scalp and tuberculosis of various glands. The microscopical appearance of sections of the papules resembles that of miliary tubercle, and, as a matter of fact, the disease is now generally regarded as a form of tuberculosis affecting the skin. Tubercle bacilli have been found in some of the papules.

**Treatment.**—Nutritious food, fresh air, sunlight, and warm clothing are of paramount importance. The patient should be directed to sponge the entire surface with salt water two or three times a week.

Medicinally, the best results can be obtained from the administration of large doses of codliver oil. Inunctions or hypodermic injections of the same remedy are also of service. The iodide of iron will often be found valuable. Quinine, strychnine, and phosphorus may also be administered.

Arsenic is sometimes of service. The external treatment consists of baths containing bran or starch, washing the affected surface with tar-soap, or inunction with codliver oil.

**Prognosis.**—The prognosis is always favorable. The eruption may prove obstinate, but time and proper treatment will finally effect a cure.

## PRURIGO.

SYNONYMS.—**Prurigo (Hebra)—Juckblattern—Strophulus prurigineux (Hardy).**

Prurigo is a chronic disease, characterized by the development of small solid, pale, or somewhat red and isolated, deeply seated, or slightly elevated papules, accompanied with intolerable intching, thickening and pigmentation of the skin. (For Summer Prurigo, see "Hydroa Vacciniforme," and also "Eruptions Caused by Parasites.")

**Symptoms.**—The disease prevails especially in Europe, varying in frequency in different places. It has been repeatedly asserted by good authorities that prurigo is only met with in North America, in the families of immigrants. The disease almost invariably appears early in life, often during the first or second year. It occasions violent scratching, the symptoms disappearing to again and again reappear, and the peculiar eruption gradually developing from the second to the seventh year. The small, isolated, and irregularly distributed prurigo nodules are characteristic. They are sub-epidermic, and about the size of a pin's-head, or a little larger. They are detected better by touch than by sight, as they are scarcely raised above the level of the skin. They are firm, and differ little, if any, from the surrounding integument in color, but at times present a pale red or purplish hue. They may be pierced with hairs, and covered with a dry and attenuated epidermis. They occur most frequently upon the outer surfaces of the extremities, particularly of the legs; the extensor part of the arms, the lumbar and gluteal regions, may also be involved. The other portions of the skin may be affected likewise; the axillary, popliteal, palmar, and plantar regions are, however, always exempt, and in well-marked cases present quite a contrast to the adjoining invaded skin.

The lesions, even before being perfectly developed, are attended with intolerable and persistent itching, which causes the sufferer to scratch and tear off the apices of the papules, from which exude serum and blood, which dry into crusts. The itching and scratching continue as the disease progresses, the skin becoming, in addition, thickened, rough, fissured, and pigmented. In a case closely observed during a period of eight months by Dr. R. W. Taylor, individual papules at times underwent involution, and with this comparative quiescence of the disease the pigmentation became less marked. Small scattered white spots, denoting slight loss of tissue and resulting from involution of papules, were also perceived. These atrophic spots gradually disappeared. The hairs may be removed or torn off by the scratching. At times buboes may follow from the severe irritation, or inflammation, which is set up in the same way. Eczema may also arise as a complication, either from the use of the finger-nails in scratching, or the application of irritating remedies. In some instances suppurative lesions, as impetigo, ecthyma, or furuncle, result from the incessant scratching, and infection by the nails, and this produces a polymorphism which does not belong to uncomplicated prurigo. Prurigo is divided into two forms, namely, prurigo mitis and prurigo ferox, or agria; in the first the symptoms are mild, while in the second they are more severe. They begin in one or the other form, and, as such, run their course singly. The disease generally lasts a lifetime, and, by its constant annoyance, gives rise to debility and often great emaciation. The majority of patients are seen in childhood, and in a very large number of cases it leads to a fatal termination.

**Diagnosis.**—The symptoms of prurigo are so marked and characteristic as to be rarely mistaken for any other affection. While the principal symptom of prurigo of Hebra is itching, this is distinguished from other itching diseases by its history, distribution and the appearance of the lesions. Occasionally it is liable to be confounded with *pediculosis*, scabies, paresthesia, and eczema. The absence of the pediculus on the skin or in the clothing, and the exemption of the hands, are sufficient to establish the diagnosis. Prurigo may be confounded with *scabies*, but the latter generally attacks the flexures, the penis, the scrotum, or fingers, while the former involves particularly the extensor portions of the legs. *Paresthesia*, of all diseases, is most likely to be mistaken for prurigo. Paresthesia may happen at any period of life, and the lesions are secondary; prurigo commences generally in childhood, and the lesions are primary. Prurigo occurs, as a rule, among the badly nourished, and paresthesia among all classes. In paresthesia, the integument is normal, except when irritated; in prurigo it is the seat of papules primarily, and is accompanied with thickening of the skin, which seldom follows in the former. Prurigo invades particularly the extensor surfaces of the legs, while in paresthesia any part or the entire body may be involved. Prurigo is attended with persistent itching; the disease continues for years, or a lifetime. In paresthesia, the irritation is frequently relieved, or cured, by a suitable course of treatment.

*Eczema* may arise as a complication of prurigo from scratching but in primary cases the location of the papules, their color, grouping, and the existence of other lesions or evidences of eczema, are sufficient for the diagnosis.

**Pathology.**—Microscopical examination reveals the fact that the appearances observed are similar, in many respects, to those of papular eczema. The papillæ and the rete are filled with young cells and an exudation of serum occurs. As the disease becomes chronic, more or less hypertrophy takes place in the corium, with pigmentation, the glands becoming enlarged or atrophied, and the epithelium may undergo fatty degeneration.

Dr. Kromayer, in a microscopical examination of skin, excised from four patients of different ages and sexes suffering with typical prurigo, found the horny layer of the epidermis thickened. Small cysts were present, in or under that layer. These cysts, which were only twice found in the rete mucosum, are probably the results of an exudation. He considers that the essential cause of prurigo consists in vaso-motor changes in the blood-vessels by which the epidermis is nourished.[1] Professor Campana, of Genoa, ascribes the origin of this affection to some alteration in the nervous system, and asserts that in prurigo he has found changes in the terminal fibrils of the nerves. He has seen that in the subcutaneous tissue many of the nerves of the skin have lost their form and are much thicker than normal.[2]

Portions of skin from Dr. Taylor's case were submitted to microscopical examination by Dr. Ira Van Gieson, who describes the blood-vessels of the lower corium as surrounded by groups of small round and small polygonal cells. The papillæ were but little changed, though some were infiltrated by the same small round and polygonal cells. The hair-follicles exhibited alterations, some being shrunken while in others pouch-like dilatations were observed. The nerve-trunks were unchanged except when situated in or near the cell clusters in the derma. Some of the papules were due to small cysts in the epidermis. These appeared to be due to distention of the intercellular spaces in the rete Malpighii, by exudation of fluid from a subjacent edematous papilla, together with degenerative liquefaction of the cells. The cysts may subsequently atrophy. Those nodules which were only perceptible to the touch disappeared in the process of hardening by osmic acid. With the exception of some cell-clusters in the derma the skin was almost normal. Van Gieson coincides with Kromayer's statement, especially in regard to the subepidermal nodules, that hardened material is not suitable for a study of the changes in prurigo.

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[1] British Medical Journal, May 17, 1890.

[2] British Medical Journal, October 13, 1888.

Jadassohn, of Berne, points out that while more prevalent among the poorer classes it frequently also occurs among the well-to-do. Its occurrence is not due to want of personal cleanliness, as it has been observed in children who had been kept scrupulously clean. There are no facts upon which to base the hypothesis of a hereditary predisposition. At the same time, he has frequently observed, as has been noted by others, that if a simple occlusive dressing be applied, the symptoms rapidly disappear, though they do not always remain absent permanently. He concludes that the nodule must be caused by external irritation. This is confirmed by the observation that where patients have been admitted into a hospital, the disease rapidly disappears, even without any local treatment, and recurs as soon as the patient returns to his former dwelling. It appears that the combination of a personal idiosyncrasy with some external irritant is necessary for the production of Hebra's prurigo. Many of the phenomena would point towards the clothing, the bed clothes, or dwelling, as the seat of the possible special irritant or toxic substance, the character of which has yet to be discovered.

**Etiology.**—The cause of prurigo is obscure. There is a form of prurigo recognized by Audry, Dubrenich and others, which is symptomatic of leukemia and pseudo-leukemia, especially occurring in chronic cases. The disease, as indicated by Bureau,[1] is characterized by two symptoms—increase in size of the lymphatics and the existence of an eruption having the appearance of prurigo. It also may have urticarial lesions, thickening of the skin, and other secondary conditions. The general health is impaired and the disease always ends fatally. Prurigo is rare in this and other countries, but is common in Austria. During a period of five years Dr. Zeisler met with twelve cases of prurigo in Chicago, and concludes that the disease is not so extremely rare in this country as had been supposed. In many of his patients the disease was of the mild variety, though most of his cases of prurigo ferox were imported, yet typical examples of the severe form do occur in natives. It develops, according to the experience of Hebra, usually among poor children who are badly nourished. Sometimes it is also observed among the better classes. It is more severe in winter than at any other time of the year. Krastilefsky has reported the case of a woman who had borne fifteen children and on each occasion had suffered with prurigo, the attack beginning a week before and continuing until the second day after delivery.

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[1] Gazette Med. de Nantes, Sept. 29, 1906.

**Treatment.**—Remedies which improve the general health assist the local agents. Codliver oil, iron, quinine, and arsenic may be used, according to the requirements of the case. The association of phenol with codliver oil seems to relieve the itching. Brocq advises the phenol to be given in daily doses of twenty to sixty centigrammes (3 to 9 grains). The syrup of iodide of iron, or of hypophosphites, may be employed when codliver oil is badly borne. Antispasmodic and sedative remedies are indicated when the patient is extremely nervous. Antipyrin, phenacetin, potassium bromide, and cannabis indica have been used with success. Simon, Pick, and Schwimmer have given daily hypodermic injections of 0.01 gramme of pilocarpine with beneficial effect. Schwimmer states that the same may be said of ergotin, in doses of from 0.05 to one gramme per day. In one case, I obtained good results from subcutaneous injections of one-eighth to one-fourth of a grain (0.008 to 0.015 gm.) of cocaine hydrochloride. The local treatment, which is all-important, should consist of baths, particularly the water bath with soap, the vapor and the medicated vapor. Tar, naphthol, and sulphur, used alone or combined in the form of ointments, may remove or temporarily arrest the disease. The occasional application of sapo viridis, followed by inunction, is often serviceable. Codliver oil is particularly recommended as a topical remedy in this disease. Massage is said to relieve itching and remove infiltration. In eight children A. Dobrowsky observed relief of the itching and disappearance of the lesions follow administration of thyroid extract. Relapse occurred, however, when the remedy was discontinued.

**Prognosis.**—Prurigo is generally considered incurable, but the milder forms occurring in children may be amenable to treatment.

## HERPES.

Herpes is an acute, non-contagious, inflammatory affection, characterized by the development of one or more clusters of vesicles, seated upon a somewhat reddened base.

**Symptoms.**—The eruption may be preceded by chilliness, headache, and fever, or may develop without any constitutional symptoms. It may appear in connection with fevers, other diseases, or exist alone; or be preceded by heat, burning, and itching. Sometimes it is accompanied with pain. The lesions appear as vesicles, from the size of a pin's-head to a split pea, situated upon a reddened base. They are usually few, and arranged in clusters. They generally contain serous or purulent fluid, and seldom burst, the contents usually drying into yellowish or brownish crusts, which fall off, exposing a reddened and afterward normal skin. An excoriation occasionally results from rubbing or interfering with the vesicles, but it also heals kindly, cicatrices rarely resulting. Herpes is an acute affection, lasting about one week, and liable to relapses. In some instances so much constitutional disturbance accompanies the eruption as to warrant the designation of herpetic fever. The lesions of herpetic fever are usually located upon mucous membranes, as those of the mouth, genitalia, or conjunctiva. In many cases it shows a disposition to recurrence, especially in children, as pointed out by Dubrenich.[1] Herpes is divided into several varieties, according to the location and arrangement of the lesions, which may be separately described as follows:

HERPES FACIALIS.—Herpes occurring on the face is also known as herpes or hydroa febrilis, and fever-sores. It may be observed upon any part of the face, as the forehead, cheeks, ears, eyelids, conjunctiva, cornea, and chin. The lips, especially the upper, are a favorite point of attack; the vesicles being small, few in number, and forming generally but one group. They may continue isolated, or they may run together. The vesicles may also involve the mucous membrane of the anterior nares, the mouth, and tongue. They develop and run their course in the manner already described, except when the mucous membrane is affected, when, owing to its delicate structure and the heat and moisture present, they usually rupture early, exposing an excoriated patch, or patches, covered with a purulent secretion, or with a yellowish or brownish crust.

Herpes facialis may follow cold, pneumonia, fever, or any impairment of the mucous membrane of the respiratory or digestive tract. In what is known as febrile herpes, the eruption may attend a certain stage of the disease, as in pneumonia. It sometimes attends each menstrual period, and appears in the genitalia as well as on the face. Relapses are frequent. Recurrent attacks of herpes of the tongue sometimes occur in those who had been infected with syphilis, but who had apparently been cured. The erosions are small, scattered, of short duration, and seem not to be specific manifestations, since they are aggravated rather than ameliorated by antisyphilitic treatment. They seem to be due, in fact, to prior irritation of the mouth by mercury and the use of tobacco.[2]

HERPES IRIS.—This variety is similar in many respects to erythema multiforme of which it is probably a modification. It begins as one or more vesicles, or vesico-papules, arranged in the form of a ring on the dorsal surfaces of the hands and feet. At times two or more rings develop, and the changes which they undergo give the patch a varied hue, resembling somewhat the colors of the rainbow, whence the name iris. Occasionally the vesicles run together, forming large bullæ. It is one of the rare forms of herpes, occurring most frequently in young persons in spring and autumn. The subjective symptoms of itching or burning are not, as a rule, marked, and in some cases are absent. The eruption usually disappears in one or two weeks, but the skin remains pigmented, and relapses may occur.

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[1] Journal de Médecine de Bordeaux, Aug. 11, 1907.

[2] Fournier: La Semaine Médicale, 1887.

Dr. J. H. Thompson, of Kansas City, Mo., has reported[1] a rare condition in which a very diffuse herpes iris coexisted with croupous conjunctivitis. The eruption was abundant upon head, trunk, and limbs. It was confluent upon the soles and palms. The conjunctival sac was entirely filled by a croupous membrane, which glued the lids together and to the eyeball. The disease lasted a month. The skin eruption disappeared and the eyes recovered their usefulness. The patient was a widow, aged twenty-seven years, of delicate physique.

HERPES PROGENITALIS.—This is also known as herpes preputialis. In the male sex it occurs, ordinarily on the prepuce, either on the external or internal surface, and on the glans and other portions of the skin of the penis. In the female the disease is more rare, and appears about the vulva, especially upon the labia majora and minora. In exceptional cases, these become immensely swollen, the herpetic vesicles coalesce, the parts are the seat of itching and burning sensations, together with pain. The patient is unable to walk, the contents of the vesicles escape and, mingled with the leucorrheal or gonorrheal discharge which may be present, produce a very offensive odor. In rare instances the vagina or neck of the uterus is the seat of herpes. The eruption is generally observed in young people and during adult age. It is preceded or accompanied with itching and burning, and at times with neuralgic pains, followed by the development of one or more clusters of vesicles, seated upon an inflamed base. The lesions may be few or many, and are about a pin's-head in size. They may be accompanied with much inflammation, leading, in addition, to more or less swelling. The lesions occasionally dry up, and the resulting crusts fall off in one or two weeks. As a rule, owing to the heat and moisture present around these parts, the vesicles burst within a very short time after their formation, and serum, pus, or blood, is poured out upon the surface. The excoriations and superficial ulcers which result are covered with serous, bloody, or purulent exudation, or with a crust, and may, from their appearance, be mistaken for syphilitic lesions. The diagnosis becomes at times even more perplexing, from scratching or irritating applications, leading to severe inflammation, hardening of the tissues and enlargement of the inguinal glands, simulating chancre or chancroid.

Herpes progenitalis may be distinguished from *chancroid* by the fact that the ulcerative action of the latter leads to a depression or excavation. A chancre is usually attended by dryness and pressure at its base, and will not cause the escape of serum or pus, as occurs in the case of herpes or chancroid. An accurate and positive diagnosis can, in the above condition, be obtained only by inoculation, or by treating the case for a time and awaiting the result. If the disease is herpetic, it will yield under simple treatment within a few days or a week's time, but if, on the contrary, it be syphilis, little or no impression will be made from simple applications. Herpes progenitalis is liable to frequent relapses. It may arise from gastric or intestinal disturbance, and follows often from coitus, particularly in those having a long prepuce. It is apt also to develop in those who have suffered with gonorrhea, chancroid, and chancre. When the subject of recurrent herpes suffers with a severe disease, the attacks of herpes temporarily cease, but when convalescence is established they reappear. The constant repetition of attacks sometimes has deplorable mental and moral consequences. This form of herpes is said to be more common in rheumatic subjects. Bataille has described an elevated form of herpetic erosions of the genitalia which closely simulates mucous patches.

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[1] Kansas City Medical Record, Nov., 1889.

HERPES GESTATIONIS.—This form occurs during or after pregnancy. It appears on the extremities as vesicles, papules, or bullæ, attended with itching and burning. The vesicles are the most predominant lesions, are ordinarily grouped, and vary in size from a pea to a walnut. It may be complicated with urticaria, neuralgia, and other diseases of a similar nature. Relapses tend to follow with other pregnancies.

Herpes gestationis may begin as early as the third or fourth week of a pregnancy, but not usually until the third or fourth month, remains until after delivery, and during a few days subsequent to parturition the eruption may experience a decided aggravation. It then, as a rule, more or less gradually, disappears. In some cases its first appearance has occurred after confinement, but has recurred during the progress of subsequent pregnancies. In a case observed by Liveing, intense pruritus and neuralgic pains marked the latter months of a pregnancy; but the eruption did not appear until the third day after accouchement. In after-years, relapses occurred in the absence of pregnancy. In two of these relapses the mucous membrane of the mouth was also severely affected. The herpes of gestation is identified by Duhring and Brocq with the herpetic dermatitis described by the former author. No exact knowledge exists concerning the pathogenesis of this affection. Leloir and Vidal suggest that it is caused by the modification of nervous activity due to pregnancy. (See also "Dermatitis Herpetiformis.")

HERPES ZOSTER (*Synonyms:* Zoster; Zona; Ignis sacer; Shingles). —In herpes zoster, or shingles, the lesions are similar to those already described, but the groups of vesicles differ somewhat in their arrangement. They develop along the course of, or near, several cutaneous nerves, often extending around nearly one-half of the body. In rare cases the affection may affect both sides; and this concurrence was believed to be fatal in its prognosis, which is now known to be an error. The disease is frequently preceded by constitutional symptoms of varying severity. Fever occurs in some cases. Pain of a neuralgic character may occur for days, rarely weeks, and commonly some hours before the appearance of the eruption, or it may be altogether wanting. It may be felt over the entire affected surface, or it may be limited to one or several points. It is generally severe, is a prominent symptom, and may be lancinating, smarting, or burning. The eruption appears first as a patch or patches of reddened skin, surrounding the seat of pain. Sooner or later there appear upon the skin one or more groups of red papules, which develop into vesicles, generally discrete, but occasionally they coalesce, producing bullæ. The lesions thus formed are usually in size from a pin's-head to a split pea. Successive crops continue to form during the course of the disease, and undergo their respective changes, giving a different appearance to the lesions in different parts of the patch or patches. In the course of three or four days after the appearance of each group, their contents become opaque, and in time purulent. In one or two weeks, they have dried into yellowish-brown crusts, which fall off, exposing a normal, pigmented, or more or less scarred, state of the skin. Neighboring lymphatic glands sometimes become enlarged. Occasionally the muscles near the eruption are the seat of painful cramps or clonic spasms. In rare instances local paralysis accompanies or follows an attack. Schlesinger has reported the case of a man who, after frontal zoster, developed complete paralysis of the corresponding motor-oculi nerve and paresis of the first branch of the first division of the trigeminus for all sensations, together with loss of sensibility of the upper segment of the cornea. Dr. Hermann Eichhorst has reported a case in which facial paralysis preceded herpes zoster. Only four such cases are known.[1]

Arthur J. Hall reported[2] the case of a man 66 years of age, who suffered with herpes of the left side of his nose and forehead. He could not open the left eye. Following this attack there remained paralysis of the third and fourth nerves and congestion of the conjunctiva. A week after the subsidence of the herpes he had a similar paralysis of the right eye, affecting the third nerve, with iritis. Bilateral herpes is not unknown, but as Dr. Hall points out herpes ophthalmicus with associated paralysis on one side, followed by paralysis without herpes upon the other side, does not appear to have been previously observed. The explanation appears to be that the patient was also suffering with diabetes, in which ocular paralysis is not uncommon.

Carmano and Gueirn, of Marseilles, have reported[3] the very rare complication of herpes of the second and third branches of the fifth nerve, with extensive ulceration of the tongue.

E. Hewat Fraser reported the case of a middle-aged man who, after suffering for five days with neuralgia of the right side of the face, had a widespread herpetic eruption on the right side of the neck, which spread to the scalp, over the ear and on to the lower part of the face; it also extended downward on the shoulder and on to the upper part of the chest anteriorly. Two weeks later he developed typical Bell's palsy. Taste was dull on the affected side of the tongue. Tactile sense was impaired on the paralyzed side of the face, but sensation and motion subsequently were restored.

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[1] New York Medical Journal, June 5, 1897.

[2] British Journal of Dermatology, Sept., 1903.

[3] Journal des Praticiens, page 71, 1907.

The late Dr. Ch. Féré states that facial zona may be complicated with hallucinations. The vesicles show no inclination to burst, as in eczema; they are deeply located, and remain until they dry up, unless interfered with. In some rare cases the contents of the lesions may be discolored by an infusion of blood into them (herpes zoster hemorrhagicus). They may run the usual course of the eruption just described, or may burst, leaving an ulcerating surface, which is followed by cicatrization. Ulceration and cicatrization may also result from scratching or rubbing. This process has been termed herpes zoster gangrenosus. Occasionally the initial lesions forming the papules do not pass into vesicles, but gradually disappear, with desquamation; this is known as the abortive form.

Herpes zoster is an acute affection, and, according as it is slight or severe, may run its course in from one to two weeks, or longer. It occurs nearly equally in both sexes, but slightly more frequently among men. It occurs in the young most frequently, between the twelfth and the twenty-fourth years. It has been especially observed during atmospheric changes. It may attack almost any part, but has a predilection for certain regions, as the face, shoulders, back, abdomen, and upper portion of the thigh. A case of herpes zoster which involved the anus, left side of buttocks, scrotum, and penis, causing paresis of the bladder and inactivity of the bowels, has been reported. Zoster is usually limited to one-half of the body, especially the right side, but at times, and rarely, it may be bilateral. It seldom attacks the patient a second time. The neuralgic pains and burning, as a rule, disappear with the evolution of the eruption, but may persist during its entire course, or remain for a long time after all traces of the disease have vanished, especially in elderly persons. The attending neuralgia is generally much less severe in children. To this annoyance there may also follow, particularly in the aged, anesthesia of the region involved, local paralysis, muscular atrophy, falling of the hair and teeth. The eye may be involved in zoster of the orbital region, with consequent inflammation of the organ and loss of sight, or death. These complications do not often happen. Ophthalmic zoster may coexist with the same disease in other situations. M. Brissaud has observed three cases in which crossed hemiplegia succeeded to ophthalmic zoster. Though ordinarily of rather rare occurrence, zona sometimes presents itself as an epidemic. The type of the epidemic is sometimes mild and at other times severe. The affection usually manifests itself but once. In these circumstances, herpes zoster resembles the infectious fevers, and the theory is now supported by some authors that it is primarily a constitutional disorder which exerts a special influence upon nerve-ganglia and that the cutaneous lesions are secondary consequences. A few cases have been observed in which a succession of vesicles was of constant recurrence, arranged along the course of a nerve-tract and accompanied by neuralgic pain. To this form the term chronic zoster has been applied. According to the anatomical region or nerve-tract invaded the disease is named: Z. frontalis, Z. ophthalmicus, Z. auricularis, Z. faciei, Z. occipito-collaris, Z. cervico-subclavicularis, Z. cervico-brachialis, Z. pectoralis, Z. lumbo-femoralis, Z. sacro-ischiadicus, Z. sacro-genitalis, etc.

Of all the varieties, the most common is that affecting the chest and abdomen. Kaposi has described four cases of what he considers to be atypical herpes zoster. Three occurred in hysterical young women, the fourth in a male. The lesions consisted of groups of papules and vesicles, some being associated with necrosis of the corium and keloid development of the scar. Though symmetrical, recurrent, and not following the course of any cranial or spinal nerve, yet the eruption presented characters which, while unusual, are not unknown in herpes zoster. Some authors have described "aberrant vesicles," scattered over various parts of the body, coexistent with the normal eruption of herpes zoster. A vesicular eruption sometimes appears upon the tongue, mouth, or throat, and has been described by various writers under the name of herpetic angina. The vesicles frequently coalesce, rupture, and leave an erosion or ulcer. In some instances this affection of a mucous membrane appears to be identical with herpes zoster. Dr. B. Pouzin has observed two cases of herpetic angina with vesicular lesions, which correspond in situation to the course of various branches of the trifacial nerve.

**Diagnosis.**—Herpes is not often confounded with other diseases. It may bear some resemblance to *eczema*, but the vesicles are larger, differently arranged, and tend to dry up, symptoms which serve to distinguish it from the latter affection.

Herpes zoster is to be diagnosed by its history, the premonitory or attendant neuralgic pain, distribution of lesions, and tendency not to rupture. *Herpes* is known from herpes zoster by appearing as one group of vesicles, attacking certain regions by preference, with a liability to relapses—diagnostic points which are wanting in herpes zoster.

**Pathology.**—Herpes, and especially zoster, is due to irritation or inflammation of the sensitive nerves, or neuritis, following some lesion of the ganglia, the Gasserian, or the spinal ganglia, being especially affected. Bärensprung first demonstrated its seat in the nervous system, and particularly involving, in zoster, the ganglia upon the posterior roots of spinal nerves, whose distribution coincided with the affected area. Wyass showed in a fatal case of zoster facialis, the Gasserian ganglion softened and altered, together with inflammatory changes along the nerve after entering the ganglion. Similar pathological changes in the sensitive nerves and the Gasserian and spinal ganglia have been pointed out by other observers. Dr. Graham has found bacilli and diplococci within the blood-vessels of the Gasserian ganglion, bunches of leptothrix-like cells within the arterioles and leptothrix in the sheath of the ganglia. These organisms were absent in this case, from other portions of the brain and medulla. Kaposi, from his investigations, has concluded that the disease is not always occasioned by inflammation of the ganglia, but that it may arise in the nerve, often at its peripheral distribution, and that it may likewise be spinal or cerebral in origin. Microscopic examination of the vesicles in zoster shows that they are developed in the rete. Bärensprung, in his examinations, found in the affected part the papillæ enlarged, the blood-vessels dilated and infiltrated, with new cells extending even into the corium and the subcutaneous tissue. Spindle-shaped cells were noted also, passing from the papillæ into the rete, which were pushed aside, the latter being thus made to appear linear in form. The nerve at the site of the eruption was found to be attended with inflammatory changes, the neurilemma being filled with cell infiltration. Certain interesting relations of herpes zoster with erythema nodosa and erythema multiforme exudation have been noted.[1]

**Etiology.**—Herpes occurs mostly in those possessing an irritable or a delicate skin. It may be due to a variety of causes, but is chiefly produced by some derangement of the mucous membrane of the respiratory, digestive, or genito-urinary tract. Rheumatism and gout seem to predispose to attacks. It occurs in diabetes although rarely. It frequently results from cold, atmospheric changes, nervous depression, and from injury to the nerves from blows or pressure, and from direct action of local irritants on the skin. Tuberculosis of the lung and other chest affections seem to predispose toward attacks. Herpes of the buttock and of the face has been observed to occur after lumbar puncture. According to Achard[2], the herpes is not the result of the drug employed, but simply of the lumbar puncture. In one case of facial herpes the eruption was bilateral. There is usually an incubation period of from two to five days. This group of cases appear to establish the essential identity of the two forms of herpes. Dr. Bulkley, of New York, has seen herpes zoster develop in consequence of Pott's disease, and in another case where a tumor of the neck pressed upon the nerves. Zoster has been observed to follow the inhalation of carbon dioxide gas, and especially the internal use of arsenic. In a series of 557 cases undergoing arsenical treatment in the Copenhagen Hospital from 1864 to 1869, Neilsen found that herpes zoster occurred in ten cases, or 1.8 per cent. Dr. Janin relates a case in which an exceedingly painful herpes zoster developed in immediate consequence of a trifling traumatism. Zona has been seen as a sequela of epidemic influenza, and

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[1] Phila. Med. Journal, vol. i, p. 1136.

[2] Société Med. des Hôpitaux de Paris, Nov. 29, 1907.

M. Féré reports four cases which occurred almost contemporaneously among his 150 patients at the Bicêtre. Malarial intoxication may cause herpes zoster, as has been demonstrated by Dr. James M. Winfield, of Brooklyn, who found the plasmodium malariæ in the blood of several patients. Zoster has appeared, itself, in a form which was suggestive of contagion and epidemicity. A large number of cases occurred, almost as an epidemic, in Berlin, in April and May, 1898. It is frequently a result of other well-known infections. In a case observed by Dr. E. Adinot, herpes zoster occurred in the tract of the radial nerve during an attack of measles in an adult. Dr. Maurice Eden Paul witnessed an attack of typhoid fever, which was immediately preceded by an eruption of herpes zoster in the lumbar region. M. Carrière encountered a case of herpes zoster in a patient suffering with uterine cancer. The eruption was situated in the tract of the left ilio-inguinal nerve, which exhibited the lesions of interstitial neuritis. The spinal cord was absolutely intact. Dr. J. D. Rolleston has reported[1] herpes facialis in diphtheria. M. H. Koebner has reported a case in which the application of a weak galvanic current in nervous headache excited intense pain, followed the next day by an eruption of herpetic vesicles. They occupied positions corresponding to the transverse cervical branch of the superficial cervical plexus. In the lymph of herpetic vesicles on the lip of a boy suffering with croupous pneumonia a great number of bacilli were found by Dr. William St. Clair Symmers. These, when cultivated under favorable conditions, elaborated a beautiful pea-green pigment. Though unfavorable circumstances may abolish the chromogenic power during several generations, this is restored when the micro-organism is cultivated under suitable conditions. Although bacteria are always present in the lesions, it is probable that they merely represent accidental infection.

**Treatment.**—The exciting cause, if found, or any obvious source of irritation, should be removed. Aperients and diaphoretics may be useful, as well as occasional blood-letting. Opiates, bromides, or chloral may also be necessary to relieve the pain, particularly in zoster. The latter is often greatly ameliorated by hypodermic injections of one-quarter to half a grain (0.015 to 0.03 gm.) of sulphate of morphine with one-eightieth of a grain (0.0008 gm.) of sulphate of atropine. Acetanilid and antipyrin have been used for the relief of pain, by the mouth or by hypodermic injection. Ether and chloroform have been subcutaneously injected for the same purpose. Three or four five-grain (0.30 gm.) doses of acetphenetidin at hourly intervals, usually alleviate the pain of zoster. Phosphide of zinc in one-fiftieth grain (0.001 gm.) doses every three or four hours, may mitigate all the symptoms. Iron, quinine, arsenic, and the various bitters or mineral acids, can be resorted to, according to the indications. A course of codliver oil may prove beneficial. Jamieson advises a mixture of equal parts of tincture of nux vomica and tincture of gelsemium of which he orders twenty to forty drops to be given during the day. According to Phillips, rhus toxicodendron is occasionally of advantage. In some cases the salicylate of sodium has been reported of service. The local treatment is especially useful. The object should be to protect the lesions, prevent their rupture, and all irritation which may follow. If seen very early, Unna states that painting with ichthyol, covering the eruption with wadding saturated with a ten-per-cent. solution of ichthyol or resorcin, or the application of equal parts of zinc-paste and resorcin will cause the vesicles to abort. But if vesicles have already formed, suppuration may be prevented by the use of a zinc-sulphur paste or alcoholic solution of corrosive sublimate, iodoform, phenol, or resorcin. In order to abort the vesicles, it has been proposed to open them and lightly touch their cavities with a stick of nitrate of silver, or to paint the affected surface with a solution of the same salt. Other substances which have been recommended in the local treatment of zoster are phenol, ointments of lead, belladonna, opium, or cocaine, liniments containing chloral or chloroform, a two-per-cent. alcoholic solution of menthol, grindelia robusta, etc. Equal parts of olive oil and lime-water, containing one or two per cent. of phenol makes a good application. Brocq's method is to carefully open all the vesicles as soon as they have formed, wash with an aqueous solution of boric acid containing a little alcohol, and cover the surface either with a layer of antiseptic cotton or a paste composed of oxide of zinc and boric acid, as follows:

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[1] British Journal of Dermatology, November, 1907.

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| ℞ | Acidi borici ........................ | 1 | gramme. |
| | Zinci oxidi ........................ | 2 | " |
| | Pulv. amyli ........................ | 2 | " |
| | Petrolati ........................ | 16 | " |

If this preparation is not sufficiently adherent, six parts of the petrolatum may be replaced by hydrated wool-fat. Starch-powder, or talcum, is then dusted over the ointment, and a thick layer of cotton completes the dressing. A suitable quantity of cocaine or morphine may be incorporated in the above formula, if the pain be excessive. Some prefer coating the lesions with flexible collodion, or solution of gutta-percha. Five grains (0.30 gm.) of morphine sulphate to the ounce (32 gm.) of collodion will often soothe pain. Dusting-powders are valuable, both for the protection which they afford and the medicinal action which they have upon the excoriation. They are particularly to be recommended for use in herpes of the genitals. They not only are the best means of medicating these parts, but, in instances in which it may be a question of lesion being specific or not, the application of a dusting-powder speedily settles all doubt. If the lesion be herpetic, the dusting-powder used causes it to rapidly dry up and disappear, while but little change will observed should the disease be of specific origin. The subnitrate of bismuth, talcum, lycopodium, carbonate of zinc, calomel, alone or combined with some other powder, the oleate of zinc, and powdered red cinchona-bark, are all useful applications. It may be well to add morphine and camphor if there be much pain.

Thymol iodide, europhen (diïsobutylortho-cresoliodide) and iodoform are also useful dusting-powders, the two former remedies being preferable on account of their comparative freedom from odor. Some practitioners prefer to make use of lotions in the treatment of herpes progenitalis, and Feulard recommends weak solutions of acetate of lead, vinegar, and water, or aromatic wine. If the ulcers are slow to heal, a weak solution (two to four per cent.) of nitrate of silver is applied to them, or they are dressed with an ointment of the same strength. In order to prevent recurrence lint may be laid between the glans and the prepuce, either dry or moistened in some tonic and astringent solution.

Compression with a bandage, or a simple or medicated plaster, is a useful means of relieving herpes. Sometimes herpes of the lip is better treated by applying a plaster, preferably zinc oxide adhesive, or silk isinglass plaster, at once to the part. It lessens the irritation, and often speedily gives relief. Simple absorbent cotton, or borated cotton, is a valuable application, particularly if the lesions have ruptured. A solution of borax with the addition of a grain or two (0.06 or 0.12 gm.) of cocaine and of morphine, is a good application to herpes of the mouth and lips. Anodyne lotions, containing lead-water and witch-hazel, are valuable. A ten-per-cent. ointment or alcoholic solution of anthrarobin has sometimes proved useful. Astringent lotions of tannic acid, alum, sulphate of zinc, or boric acid, are frequently best borne, especially if the part has become excoriated. Schwimmer reports good results in zoster from a ten-per-cent. solution of thiol twice a day.

Rapidly curative, or even abortive, virtue is ascribed by Professor Leloir, of Lille, to alcohol and alcoholic solutions, according to the inaugural thesis of Dr. Dupas. Compresses saturated in the solution are applied to the lesions and kept in position by means of absorbent cotton or some impermeable material. The dressings should be changed frequently during the day. The substances employed are ninety per cent. alcohol, two or three parts of resorcinol to one hundred of alcohol, one per cent. of thymol, or three per cent. of menthol in ninety-five per cent. alcohol. Two per cent. of hydrochloride of cocaine or five per cent. of extract of cannabis Indica may be added, when the pain is severe. This plan of treatment has been found useful both in herpes labialis and zoster. Sedative or astringent ointments, possessing any of the ingredients just named, may be employed. Ointments containing cocaine, conium, or aconitine, have a local analgesic effect, though the use of the last two requires great caution, especially if the surface be abraded.

The use of the galvanic current applied directly to the nerves, every day, will often lessen or relieve the pain of zoster. chenoceti, or whale-oil, is extolled by Dr. Gustav Guldberg as p of great penetrative powers and as a valuable vehicle for chlorofor a local analgesic is required, as in herpes zoster. It is a ref derived from the *Balenoptera rostrata*, and is of lower specific grav any other animal oil. A mixture of equal parts of the oil and chl is rapidly absorbed, and produces a sedative effect upon termina fibres.

The treatment of herpes gestationis is identical with that of titis herpetiformis, and is given in the pages devoted to the consi of the latter affection.

**Prognosis.**—The prognosis is favorable, except in orbital zoste is occasionally fatal. When the cornea is affected, perforation titis may result. The other varieties disappear in one or more we they are liable to relapses.

Herpes zoster may be persistent, often continuing for some ti disappearing, to be followed by a relapse. Obstinate neuralgic pa also occasionally remain in the part for months or years after th tion has been removed. This is especially apt to be the case in th Persistent scars may be formed, but generally the affected spots slowly to the normal.

Dr. Lemounier[1] has encountered ten cases in which zona lowed by tuberculosis. In some patients the latter developed imm or within a few months after the appearance of the zoster. In the outbreak of tuberculosis was delayed four and a half years.

## MILIARIA.

Synonyms.—Miliaria rubra—Miliaria alba—Lichen tropicus—Prickly

Miliaria is an acute inflammatory affection of the sudoriparous characterized by the formation of numerous minute papules or and accompanied by marked prickling, tingling, or burning se and more or less itching. It is usually more or less associat erythema.

**Symptoms.**—The eruption of miliaria usually appears with premonitory symptoms. In the majority of cases it consists en papules. It may, however, be purely vesicular in character, or consist of both papules and vesicles.

The papular variety is sometimes termed lichen tropicus, frequent occurrence in tropical climates, but it is popularly k prickly heat. It is characterized by the sudden development of ber of exceedingly minute papules. They are acuminated in fo bright-red in color. The papules vary in size from a small pin's-head to a grain of mustard-seed. They are situated around the orifices of the sudoriparous ducts, and are slightly elevated above the surrounding surface. They are usually developed in great numbers, and are closely set together. They do not coalesce, but remain discrete throughout their existence. The lesions may appear upon any portion of the body, and in severe cases not infrequently involve the entire surface. They are most frequently observed, however, upon the scalp, neck, chest, back, and arms, and generally remain for a few hours or days, and then disappear as suddenly as they came. In severe cases the papules may be present for several weeks. Relapses are of frequent occurrence.

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[1] Bulletin Médicale, No. 38, 1890.

The eruption is almost invariably preceded and accompanied by marked increase of sweat. In some exceptional cases the secretion of sweat is notably diminished.

The entire cutaneous surface upon which the papules are developed is intensely reddened, and is the seat of more or less itching, stinging, and burning sensations. The eruption may be complicated by the formation of vesicles and vesico-papules.

The vesicular variety of miliaria is characterized by the simultaneous development of a number of exceedingly small vesicles, which are acuminated in form, and are surrounded by an erythematous areola, which sometimes rapidly spreads over the neighboring surface until it becomes uniformly red, owing to hyperemia. They are transparent at first, and contain a drop of clear serous fluid, but become opaque or yellowish in a few days. The vesicles generally occur in large numbers, and are placed close together. They may appear upon any portion of the body, but are most frequently observed upon the neck, chest, back, and arms. They run an acute course, usually terminating in absorption and desquamation in a few days. The eruption is accompanied by itching and burning sensations, which are sometimes so severe that the patient tears the skin and ruptures the vesicles in order to obtain relief. The crusts which are formed by this procedure are small in size and insignificant in character, and usually disappear by desquamation in a few days. Relapses may occur, however, and protract the disease for several weeks. I have seen cases in which the eruption recurred at intervals for four months before it finally disappeared.

**Diagnosis.**—The only affection which presents any resemblance to the papular variety of the disease is *eczema papulosum*, but the distinction between them can readily be made by considering the history, course, and subjective symptoms of each. The papules of miliaria appear suddenly during intensely hot weather. They are exceedingly numerous and closely set together, but never coalesce to form large patches. They are usually accompanied by excessive perspiration and marked stinging, prickling, or burning sensations, and more or less itching. They are ephemeral in character, and ordinarily disappear as soon as their exciting cause is removed. The papules of eczema occur more frequently during winter than in summer. They are comparatively large in size and few in number, and are not so closely aggregated as in miliaria. They are developed slowly, and manifest a tendency to remain for weeks. They are not accompanied by any increase of perspiration, or by the characteristic prickling of miliaria. The itching in eczema, however, is distressingly severe.

The vesicular variety of miliaria may be mistaken for sudamina or for vesicular eczema. In *sudamina,* however, the lesions usually appear as pearl-colored drops of sweat beneath the superficial layers of the epidermis, and are rarely elevated in the form of vesicles. They are not accompanied by any inflammatory or subjective symptoms, and disappear by absorption, without any noticeable desquamation. In miliaria vesiculosum the vesicles are numerous and well defined. They are surrounded by an inflammatory areola, and are accompanied by marked prickling, burning, and itching sensations. In *eczema* the vesicles are not surrounded by a distinct areola, but are situated upon an intensely reddened surface. There is intense itching, and they usually rupture spontaneously, terminating in the formation of crusts, beneath which more or less exudation occurs. In some cases the vesicles become transformed into pustules. In miliaria, however, the vesicles never rupture spontaneously, or become pustular, but usually disappear by absorption as soon as the exciting cause has ceased to act.

**Pathology.**—The pathological process concerned in the production of the lesions of miliaria consists of active hyperemia of the vessels of the sudoriparous glands, producing, primarily, a marked increase of the sudoriparous secretion, and, secondarily, more or less exudation into the substance of the glands and their ducts, and into the surrounding tissues. If the exudation be small in amount, the resulting eruption is papular in character; if large in quantity, vesicles are formed. When the hyperemia subsides, the exudation is absorbed and the eruption disappears.

**Etiology.**—Miliaria is produced by excessive stimulation of the sweat-glands and unusual activity of function, brought on by exercise during the summer, or to exposure to severe heat. It may happen in tropical climates at any time during the year, but in countries situated in the temperate zone it is met with only during warm weather. It may be developed or aggravated by wearing too heavy or too light clothing.

The corpulent, and children, are most liable to attacks of the papular variety. According to my experience, it is much more prevalent in subjects of nervous temperament and fair complexion than in those of lymphatic disposition and dark complexion. As those who are subject to it are usually in robust health, its appearance is frequently regarded by the laity as "a healthy sign."

Weak and anemic persons are more subject to the vesicular variety than the stout and well-nourished. It is often observed in pale, overworked women, and in puny, ill-fed infants and young children.

**Treatment.**—The majority of cases of papular miliaria require no treatment other than the substitution of light for heavy under-clothing, and the frequent application of cold water to the seat of the eruption, followed by dusting with talcum powder. In obstinate cases, or in very fat persons, the bowels should be freely opened with saline cathartics, and meats and condiments excluded from the diet for a few days. Acidulated drinks may be partaken of with advantage. Chalybeate and other tonics may be employed with benefit in the vesicular form of the disease when it occurs in debilitated patients.

The best local treatment consists in the free application of cold water, after which the parts should be mopped dry with a soft cloth, and dusted with bismuth subnitrate or zinc oxide, or talcum. If itching and stinging be severe, relief can usually be obtained by the use of a lotion containing two grains (0.12 gm.) of phenol to an ounce (32 gm.) of water. Good results can also be derived from applications of the ordinary official peppermint-water, or a solution of menthol, five grains (0.30 gm.) to the ounce (32 gm.). In India, a lotion composed of ten grains (0.60 gm.) of sulphate of copper to the ounce (32 gm.) of water is much employed. Aqua creasoti is also palliative. Lotions of alum, or of sulphate of zinc, or of acetate of lead, are occasionally serviceable. In some cases soothing ointments will be found more available. The ointment of the oleate of bismuth is especially valuable.

A dusting-powder for miliaria in young infants, recommended by Comby[1], is composed of:

| | |
|---|---|
| ℞ Lycopodium, | |
| Starch, | |
| Bismuth subnitrate, | |
| Talcum | āā 15 grammes. |
| Menthol | 1 gramme. |

**Prognosis.**—The prognosis is always favorable. The eruption speedily disappears as soon as measures are taken to counteract the effect of the excessive heat.

## PEMPHIGUS.

SYNONYM.—Blasenausschlag.

Pemphigus is an acute or chronic disease, characterized by the successive development of variously sized and shaped bullæ, which are filled with a colorless or yellowish serous liquid, which is sterile, unless accidentally contaminated and infected. Pemphigus mostly runs a protracted course, and on subsiding leaves on the skin only dark stains.

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[1] Bulletin Générale de Thérapeutique, April 8, 1907.

**Symptoms.**—There are two varieties of pemphigus, namely, pemphigus vulgaris and pemphigus foliaceus, each of which, on account of the marked variation in their symptoms, requires separate consideration. The former, which is most frequently observed, is generally either acute or chronic, while the latter, which is very rare, is at all times chronic.

PEMPHIGUS VULGARIS.—The disease may be either acute, pemphigus acutus, or chronic, pemphigus chronicus. The acute variety occurs usually in children, sometimes in the form of an epidemic, and runs its course in from two to three weeks. This form may or may not be attended by marked constitutional disturbance. In pronounced epidemics it is apt, in infants, to be complicated by purulent conjunctivitis. The chronic form is the one most frequently observed, especially in the adult. The disease may be ushered in without any prodromal, or with mild or severe constitutional symptoms. If constitutional symptoms are present, they may simply consist of a feeling of lassitude, or of chilliness or rigors, headache, pains through the body, quick pulse, occasionally delirium, and irritability of the mucous membrane, especially of the stomach. Fever, if present, usually ceases with the subsidence of the eruption, to return again on a fresh outbreak. The eruption may appear first in the form of erythematous spots or wheals, on which blebs develop. At other times blebs may form at once on the skin, and neither be preceded by erythematous spots or wheals. The blebs are seldom accompanied with inflammation, their bases only being reddened, and the encircling skin either normal or slightly erythematous. They may be attended with itching and burning, the former being usually more marked. Occasionally both symptoms may occur to a decided degree, leading to great suffering; this form of the disease is spoken of as pemphigus pruriginosus. The blebs may develop rapidly or slowly, and may attack all portions of skin or mucous membrane. The scalp, palmar and plantar surfaces, and conjunctivæ[1] are rarely invaded. Steffan, in 1884, wrote upon pemphigus of the conjunctiva, and its relation to so-called essential xerosis of the conjunctiva, in which, in addition to his own case, he collected fifteen observations from other authors. Since that time similar cases have been placed upon record by Gelpke, Bäumler, Schmidt-Rimpler, and Deutschmann.[2] Steffan concluded that the rare cases hitherto described as essential xerosis of the conjunctiva are really due to localized chronic pemphigus. With this opinion Professor Deutschmann coincides, since he has had under observation a decrepit old lady, in whom a typical process of xerosis was associated with pemphigus of the conjunctiva and roof of the mouth. Pemphigus may also invade the mucous membrane of the pharynx and

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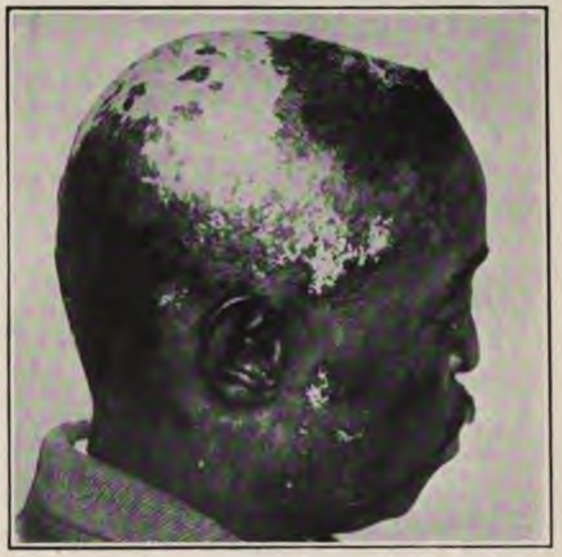
[1] Cohn describes only one case in fifty thousand eye-patients. Breslauer aerztliche Zeitschrift, 1885.

[2] Ueber pemphigus conjunctivae und essentielle Bindehautschrumpfung, von Prof. R. Deutschmann in Beiträge zur Augenheilkunde, II. Heft. Hamburg und Leipzig. Leopold Voss, 1891.

PLATE XV



Cicatrices of the Scalp following Pemphigus.

(See page 480)

larynx. In these situations it is obstinate and fatal. Du Mesnil found the lesions of pemphigus in the stomach of a man who had suffered from the same cutaneous disorder, but had died of an intercurrent affection.

The number of blebs vary from one to many; they may be isolated or arranged in groups. In size, they range from a pea to a hen's-egg, or larger. In form, they are mostly hemispherical or oval, but if they become confluent their characteristic shape is destroyed. Their walls are tense at first, but, by absorption of the fluid, may become somewhat flabby. Their contents, in the beginning clear or opaque, gradually become in time sero-purulent. In some instances they present a reddish or dark appearance, from blood being effused into them. They run their course in from two to eight days, and are succeeded by successive crops of new blebs. They disappear, as a rule, by absorption, their walls becoming shrivelled, with newly formed epidermis beneath. At times they burst, developing excoriated surfaces, or, after rupturing, their contents may dry into thin scabs. Dark stains are left, for a long time, to mark their location. The skin in pemphigus may be said, therefore, to present the characteristic appearance of this disease when the skin surface is covered with few or many blebs, in their various stages of formation, with excoriated spots, thin scabs, and dark stains.

The differing appearances produced by the bullæ in their different stages and sizes have led to a needless and confusing enumeration of varieties of the disease, no less than ninety forms having been distinguished by various writers.

In a case narrated by Mr. Arthur Clarke, of Street, Somerset, England, bullæ, some of which were as large as small oranges, developed upon the inner side of the forearms, and in the axillæ; also along the inner side of both thighs. The attack occurred in a multipara, thirty-six years of age, on the fourth day after delivery, lasted but a few weeks, and was not accompanied by much constitutional disturbance. The course of the disease will largely depend upon the state of the patient's health, which influences the development of either benign or malignant pemphigus. The former is of a mild type, and usually runs its course rapidly. In the latter variety the blebs are large in size and number; they develop rapidly, coalesce, dry up, or rupture, discharging puriform or bloody exudation; crusts form, and perhaps excoriated or ulcerated surfaces result. The subjective symptoms of itching and burning are markedly severe, the health becomes undermined, and death often follows, especially in cachectic patients.

Pemphigus Foliaceus.—This variety of pemphigus is exceedingly chronic. It usually appears as one or more bullæ on the front of the chest, which are not tense, as in pemphigus vulgaris, but flaccid, the fluid tending to burrow beneath the epidermis, instead of elevating it in blebs. These imperfect formations are the characteristic features of the disease, and contain a milky or yellowish-red fluid. The bleb, or blebs, thus formed is succeeded by others, which develop around or unite with them; or the primary bleb spreads by peripheral extension. The contents are poured out by the rupturing of the bullæ, and dry into thin and friable crusts. The epidermis hangs in shreds from the excoriated surface, giving it the appearance of a superficial scald. It seldom reforms on the invaded part, or, if it should, it is removed by successive formations of blebs. The disease gradually, as the bullæ increase and multiply, spreads until the entire body is involved. The epidermis no longer forms a sufficient covering, the surface becomes the seat of fissures, with here and there crusts, and the movements even are painful. The hairs become thin and fall out, the eyelids ectopic, and the nails friable. The general health is decidedly interfered with, usually after the disease has lasted for some time. Sleeplessness, fever, loss of appetite, diarrhea, and other serious systemic disturbances follow, which may ultimately terminate in death. The cure of the foliaceous variety, though not impossible, is rare. In some cases death supervenes within a few months from the beginning of the attack.

PEMPHIGUS VEGETANS.—A few cases of a fatal variety, known as pemphigus vegetans, have been encountered, mostly in Germany. An account of this form was given at a meeting of the Royal Medical and Chirurgical Society, March 12, 1889, by Dr. H. Radcliffe Crocker, who had met with a case, the first known to have occurred in England. Dr. J. Nevins Hyde, of Chicago, has reported the first observed case in the United States.

The first symptom usually experienced is pain in the mouth from formation of bullæ upon the mucous membrane. In a few days, or weeks, bullæ form upon the integument. Instead of disappearing in the usual way, these blebs burst and leave superficial ulcers, which remain unhealed for a long time. In some cases, the conjunctiva or the larynx is attacked. It is with great difficulty in the latter cases, that nourishment can be administered. Suppurative onychitis, with loss of nails, occurred in five cases. But seventeen undoubted cases of this disorder are on record. In women the disease may begin upon the vulva and invade the rectum and cervix uteri. In warm and moist regions, as the groins and axillæ, fungating papillary growths develop upon the site of the ulcers, and furnish a very offensive muco-purulent discharge. The strength is gradually undermined, and all the cases terminate in death, mostly within nine months; but Mracek has reported a case which had existed for more than seven years, and at times the lesions had entirely disappeared under the influence of arsenic.

White reported[1] the history of a patient, a woman 23 years of age.

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[1] Med. Rec., Sept. 19, 1903.

She was distinctly hysterical and of a tuberculous parentage. For three years she had suffered with a recurrent bullous dermatitis, which had attacked one part of the body, each attack lasting about a week and leaving no mark behind. He regarded the case as an example of an extraordinary hysterical dermatosis. It seemed impossible to regard these one-sided, periodical, progressive bullous outbreaks as due to the ingestion of drugs or to the infliction of self injuries, and he knew of no cutaneous disease with such characteristics, outside of the mysterious dermatoses which he had learned to associate with hysteria. The presence of erythema or other signs of dermatitis will distinguish such cases from pemphigus.

**Diagnosis.**—The diagnosis of pemphigus, when fully developed, is not, as a rule, difficult, and is made principally by exclusion. The fluid in the blebs is ordinarily free from micro-organisms. It must be remembered that the mere presence of blebs is not indicative of pemphigus. They may be produced by artificial means, such as the local application of hot substances, or cantharidal preparations, and in the course of certain diseases, such as scabies, eczema, syphilis, herpes iris, impetigo contagiosa, erysipelas, urticaria, and leprosy. They may be caused by friction and pressure, as from walking, riding, rowing, and wearing tight apparel or bands, or from applications to the skin of chemical substances, as nitric acid. The non-existence in these cases of successive outbreaks over a large surface, and the absence of depression, weakness, and emaciation, attendant as a rule upon pemphigus, will usually establish the diagnosis. In case of doubt, the opinion should be suspended, and the patient watched to decide whether the eruption is the result of accident or design.

*Scabies* at times simulates pemphigus. The history of scabies, its contagiousness and peculiar predilection, finally the recognition of the burrows and itch-mite, point to the nature of the disease. *Eczema rubrum* may be confounded with chronic pemphigus foliaceus; the denuded surface covered, perhaps, with more or less crusts and scales in both diseases, might readily lead to a mistake. The constitutional symptoms in pemphigus, with possibly the successive outbreak of the blebs, the slight itching, and absence of infiltration, with the deeply pigmented skin, cause the disease to be recognized. *Syphilis* may give rise to a bullous eruption, which is incorrectly called syphilitic pemphigus. The use of the latter term should always be avoided, as it implies a connection between syphilis and true pemphigus which is erroneous. In syphilis the blebs, when they occur, dry into thick, bulky, greenish crusts, beneath which exist excoriations or ulcers; in pemphigus these conditions are wanting. In *herpes iris* the bullæ may likely be mistaken for pemphigus. Herpes iris is always an acute affection, continuing usually a few weeks; pemphigus is mostly a chronic disease, lasting for some time. In herpes iris, severe systemic symptoms are absent, and the eruption occurs generally on the arms, hands, and feet; in pemphigus constitutional symptoms exist, severe, and the disease has no particular seat. Again, in herpes i vesicles and blebs are of varied colors, being arranged concentricall surrounded by an erythematous areola; in pemphigus there is an a of color, the lesions are not arranged concentrically, and the surrou skin is usually normal. *Impetigo contagiosa* may bear a close resem to pemphigus, but the absence of constitutional symptoms in the f and its tendency to involve the lower extremities, with the slow cou its lesions, should assist in distinguishing it from pemphigus. In *ery* the development of blebs is not uncommon, but the course of the tion, which is so distinct from pemphigus, enables one to detect it nature. Blebs may occasionally develop in *urticaria*, but the occur also of ordinary wheals should clearly demonstrate the disease. The of *leprosy* are usually attended with cutaneous anesthesia and characteristic symptoms which are not present in pemphigus.

*Dermatitis Herpetiformis* is diagnosticated by its polymorp and herpetiform grouping, the bleb playing an apparently unimpo part. There are considerable subjective symptoms, and much pru This disease is of long duration, from six months to twenty (Duhring.)

It is customary and convenient to consider Duhring's disease distinct type; but it is closely related to pemphigus in its sympt clinical course, and general character. In clinical cases that are not marked, it may be impossible to decide the question of diagnosis bet pemphigus and dermatitis herpetiformis.

**Pathology.**—The formation of the bullæ may be preceded hyperemia, or they may appear before any congestion can be dete Their contents, in the early stages, are a colorless or yellowish fluid, consist of serum, epithelial cells, and sometimes blood-corpuscles, pus fatty acid crystals. Some observers have also claimed to have disco free ammonia and uric-acid crystals. The fluid is sterile and is neutral or alkaline in reaction, and becomes more alkaline as it older. Jarisch gives its specific gravity as 1.0196, and adds that composed of 941.9 parts of water and 58.1 parts of solid matter. A scopical examination of the blebs, in chronic pemphigus, shows that exist between the rete cells, or between them and the corium. The rows of rete cells may remain normal, or be destroyed. The bullæ, having attained a certain size, usually consist of but one chamber they may be divided into compartments by bands of a fibrinous mat The corneous layer, as a rule, is normal, but the papillæ and blood- are enlarged, and the corium and subcutaneous tissue are infilt The question whether the bleb formation is due to an inflamm process, or to a special degeneration of cells, is unsettled. The f view is denied by many writers for the reason that, clinically, no infla tory symptoms are apparent. The bleb forms on a white and apparently normal surface. There is no redness or edema as in other bullous diseases. Ausspitz, therefore, attributed the process to solution of the prickle cells which are crushed by the increasing fluid contents, and gave to this process the title "acantholysis." But whether this is the true explanation or it be merely a violent serous exudation, it is not clear where the impulse to these processes originates, or what is the efficient cause. Three hypotheses have been proposed: (1) The theory of auto-intoxication; (2) the parasitic theory, and (3) the neuropathic theory. The typical forms of chronic pemphigus are pemphigus vulgaris, pemphigus foliaceus and pemphigus vegetans. In pemphigus foliaceus, Neumann also discovered "the connective-tissue bundles of the cutis thickened, the rete cells clouded by finely granular masses, the sweat-glands enlarged and filled with necrotic cells, the excretory ducts dilated, and the horny layer imperfect." In fatal cases an examination may show general anemia, flabbiness of muscles, edema of brain and lungs, chronic degeneration of the liver, spleen, and kidneys. In pemphigus foliaceus, Petrini found lesions of the cutaneous nerves, roots of the spinal nerves, and the spinal ganglia; while Leredde asserts that more than half of the white blood corpuscles are altered and abnormal in some respects.

**Etiology.**—Pemphigus is rare, and, as a rule, non-contagious. Cases do exceptionally occur, however, of direct communication of the disease. Dr. Salvage relates the case of an infant, in whom pemphigus manifested itself on the third day after birth. Four days before the bullæ ceased to develop on the child, several appeared on the breasts and forearms of the mother. Shoenberg reports the case of a child who suffered with pemphigus, apparently contracted from cows. The disease began in a vesicle, which developed from a scratch upon the fingers. An acute pemphigus of very fatal character, in some instances, attacks butchers or those whose occupation obliges them to handle animals or dead portions of animals. This variety of the disease occurs in consequence of the presence of a wound of the hand or fingers, and is of infectious origin. The evidence of the infectious character of ordinary pemphigus is, at present, conflicting. Experimental inoculations have generally proved unsuccessful, and cultures have failed to reveal the presence of a specific micro-organism. On the other hand, as has been said, cases of transmissions are met with; Vidal and Colzat claim to have successfully inoculated adults from the liquid contained in bullæ, and Gibier has described a special bacillus. An organism has also been studied by Lukasiewicz. A diplococcus was found in acute pemphigus by Demme. Dännhardt found a similar organism in a case of chronic pemphigus. The disease is sometimes epidemic among infants and children. Pemphigus in children has been known to follow the attendance of certain midwi
with in all countries, but more frequently in

States. Its causes are obscure. It is more common in infants and children. After childhood it occurs with equal frequency at all periods of life. It affects both sexes; pemphigus foliaceus is said to be more frequent in women. Occasionally it has been known to be hereditary. It is prevalent at all seasons. Atmospheric conditions do not appear to influence its production. Unsuitable diet may assist in developing it. Pemphigus arises, as a rule, from a depraved state of the system. This condition may be caused primarily through the blood, or may be due directly to an impairment of the nervous system. Jarisch has shown the connection with the latter, in a case in which he discovers anatomical changes in the spinal cord. Dejerine and Leloir have also demonstrated its relationship with the nervous system as manifested by changes in the peripheral nerves. Worry, overwork, excesses, exhaustion, and menstrual troubles are fruitful causes. Henoch has met with acute pemphigus in children, as a sequel of one of the exanthematous fevers. It may make its appearance after recovery from scarlet fever or measles, may be accompanied by a tolerably high fever, and may even prove fatal. On the other hand, it may pass into the chronic variety, and last for months or years. Henoch conceives that these cases may be due to the influence of various deleterious products which had been produced during the course of the fever, and which had not yet been eliminated from the circulation. It has followed vaccination in an infant, who was vaccinated upon the leg. Pemphigus has been known to develop after severe fright. In a case reported by Kaposi,[1] an injury to the right middle finger was followed by the development of a pemphigus, which gradually ascended the right arm to the right side of the neck, passed thence to the left side, and finally invaded a great portion of the body.

**Treatment.**—Both local and constitutional treatment are necessary. Attention to hygiene and rest, with freedom from all excitement, are essential. The food should be of the most nutritious nature, and should consist principally of meat, eggs, and milk. Attention should also be directed to correcting any functional derangement, and remedies given which will overcome debility and tone up the system. Spirituous and malt liquors, the preparations of malt, and the oils, particularly codliver oil, or substances containing oil, as linseed-meal—used successfully by Sherwell—are very good for this purpose. The general tonics, the mineral acids, the preparations of ammonia, are sometimes indicated. In the acute forms, in which the febrile symptoms are severe, it may be necessary to have recourse to general blood-letting, with purgatives and antiphlogistic regimen, so well advised by Wilson. Pain, if present, may be counteracted with an opiate, particularly in the form of a hypodermic injection of morphine. All complications which may arise are to be treated according to the indication in each case. Arsenic is effective, especially in the form of small doses of sodium arsenite. Hutchinson reports the curative action of arsenic, and believes it acts almost as a specific for the disease. Quinine, in full doses, is a valuable remedy, as well as idiode of potassium, which was recommended by Wilson. T. McCall Anderson[1] recommends quinine and arsenic as being more certainly effectual if injected subcutaneously. Potassium chlorate has been used with benefit by Bärensprung, and I have also found it a useful remedy in large doses. Tilbury Fox likewise employed potassium chlorate from the outset of the disease, in children, with quinine and wine. In one case, unamenable to the influence of arsenic, G. H. Fox saw improvement follow the administration of chaulmoogra oil. Blaschko has found that the internal administration of antipyrin gives relief to the itching which attends some cases of pemphigus. In pemphigus vegetans, Hutchinson recommended small doses of opium, given three times a day.

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[1] Archiv für Dermatologie und Syphilis, Heft vi, 1890; British Medical Journal, December 20, 1890.

Local treatment is of great advantage in relieving the discomfort. Blebs should first be punctured, and the contents permitted to escape under the antiseptic precautions required by modern surgery. This operation is needful to bring the epidermis in contact with the corium, and prevent the blebs from rupturing spontaneously and causing excoriations. A dusting-powder of talcum or of equal parts of starch and impure zinc carbonate, or one more stimulating and astringent, as three parts of starch to one of powdered zinc oleate, should then be applied. It is sometimes more beneficial first to use either a lotion or an ointment, and afterward dust the powder over the surface. Lotions of tincture of witch-hazel, fluid extract of arnica, likewise of grindelia robusta, the tincture of opium, lead-water, and chlorate of potassium may be used; the latter being especially serviceable when the mucous membrane of the mouth is involved. Ointments of zinc, lead, and bismuth are also of benefit. The external use of codliver oil is likewise advantageous. Betanaphthol-ointment is a useful application and relieves the itching, which is often troublesome. Tar-ointment, either full strength or diluted, or the compound tar-ointment of the national formulary, is also of service. If the blebs have burst, and excoriations resulted, the same applications are recommended. If the sores persist, a weak mercurial ointment—five or ten grains (0.30 to 0.60 gm.) of calomel to the ounce (32 gm.)—may be applied, or they may be touched with lotions of two to ten grains (0.12 to 0.60 gm.) of silver nitrate or zinc sulphate to the ounce (32 gm.). Baths, either simple or medicated, are frequently of service, particularly if there be much irritation or inflammation of the skin. The bath may be either warm or tepid, and it may be made emollient by starch, bran, or gelatin, or alkaline by bicarbonate of sodium. The bath of corrosive chloride of mercury—one to two drachms (4 to 8 gm.) of the salt sufficient—has been of advantage. The liquid tar-bath has als recommended, especially in pruriginous pemphigus. Severe cas benefited by the constant application of one of the ointments mentioned, or by the continuous water-bath, as recommended by and Kaposi. The bath just alluded to, however, is not well borne cases, and, when it is, can only be practically used in hospita requires a bath-tub specially arranged, in which the patient ea sleeps. Antiseptic and slightly astringent powders or ointmen advised in pemphigus vegetans.

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[1] "A Treatise on Diseases of the Skin," by T. McCall Anderson, M.D. London, Charles Griffin & Co., 1887.

**Prognosis.**—Pemphigus is an obstinate and at times a fatal d The prognosis, however, depends much upon the variety, being favorable in pemphigus vulgaris than in pemphigus foliaceus. former, occurring in young and vigorous persons, if the lesions slowly and are not attended by fever, the result is, as a rule, favorabl old persons, on the contrary, or if attended in the young with bron intestinal, or kidney complications, the termination may be fatal. prognosis is also unfavorable in cases attended with continuous feve debility, and in which the blebs appear in numbers, rapidly and su sively, and whose walls are flabby and tend to rupture. The disea liable to frequent relapses.

EPIDERMOLYSIS.—In some individuals it has been observed that slight irritation of the skin is sufficient to excite a blister. This tende is hereditary, and may affect several members of a family; first manif ing itself in early childhood. It is most apt to occur in summer, and often attended by hyperidrosis. The blebs may be hemorrhagic or pu lent, but are generally serous as regards their contents, and finally appear without scarring. Any portion of the body may be affected; especially those parts subject to friction from clothing. Occurring the finger ends, loss of nails, or deformity, may result. The treatme hygienic and palliative. Ergot, arsenic, quinine and iron may be use Locally, dusting-powders of talc or stearate of zinc may be tried.

## DERMATITIS HERPETIFORMIS.

SYNONYMS.—Pemphigus aigu prurigineuse—Herpes gestationis—Herpes circin bullosus—Impetigo herpetiformis—Herpes exanthematosus.

Dermatitis herpetiformis, formerly called hydroa, is an acute chronic inflammatory affection, characterized by the appearance of circ erythematous patches of various sizes, upon which vesicles or bullæ bec developed. It is accompanied by intense itching and more or less stitutional depression.

**Symptoms.**—This disease is usually preceded by general malaise, of appetite, and various gastric disturbances. The eruption show decided tendency to become symmetrical, and usually commences as red, circular spots, which itch intensely. They rapidly increase in size, and become slightly elevated above the surrounding surface, assuming a papular or semi-papular form. Occasionally adjacent spots mingle and form large, irregular patches. They may appear upon any portion of the body, but are more frequent on the face and the extremities. After a period, extending from a few hours to several days, a number of vesicles may be observed upon each erythematous area. They are arranged in groups, and frequently coalesce and form large bullæ, from half an inch to an inch in diameter. The further course of the eruption varies in different cases. The vesicles and bullæ may disappear by resolution, they may rupture spontaneously and terminate in the formation of crusts, or they may be ruptured by the patient while scratching. In rare cases, they become transformed into pustules, which finally break down and cover the surface with yellowish or greenish crusts. The eruption may pursue an acute course, but it usually remains with remissions and exacerbations for several months, or even for two or three years. It is always accompanied by marked itching and burning sensations, and various symptoms of nervous depression or general debility. This form of skin disease may occur at any age and in either sex. It is not infrequently observed during pregnancy. A rare variety, termed hydroa vacciniforme by Hutchinson, is characterized by the production of crusts which, when they fall, leave deep cicatrices.

Quinquaud has published the description of a case which he denominates hydroa-stomatitis. The patient was a young woman in whose mouth were found small bullæ. A similar eruption, without a trace of erythema, was found upon the hand. Their development was accompanied by fever, and microbes were found in the urine and the blood.

**Diagnosis.**—The affections from which dermatitis herpetiformis is to be distinguished are herpes zoster, herpes iris, pemphigus, and varicella. In *herpes zoster*, the vesicles are seated upon a reddened base, but they are usually small in size, and are developed over the course of the peripheral nerves. In this disease the lesions consist of large vesicles or bullæ, and are not limited to the track of the nerve-supply. In herpes zoster there is little itching, but the pain is intense, and the lesions are almost invariably limited to one side of the body. In this affection the pain is trivial, but the itching is violent, and the eruption appears on both sides of the body. *Herpes iris* frequently closely resembles dermatitis herpetiformis, but the concentric character of the rings, and the absence or trivial character of the itching, will prevent any error from being made. The large bullæ have been mistaken for those of pemphigus. In *pemphigus*, however, the itching is seldom marked, and a fatal result not infrequently ensues. In this disease the itching is intense, and recovery is the rule. The vesicles of *varicella* present a superficial resemblance to those of hydroa vacciniforme. Varicella, however, is a disease of childhood, characterized by the development of a variable number of isolated disseminated vesicles, accompanied by elevation of temperature, but unattended by marked itching. The eruption of hydroa vacciniforme appears on the face and exposed parts of the limbs; while varicella appears on the trunk and other covered parts of the body, principally. Dermatitis herpetiformis usually appears during adult life, the vesicles are grouped, there is no fever, but the itching is intolerable.

**Pathology.**—Reflex irritation of the peripheral nerves is probably an important factor in the production of the various lesions of the disease. The capillary vessels of the corium become dilated, and an extensive exudation of serum occurs, resulting in the infiltration and elevation of the papillary layer, and the formation of vesicles and bullæ.

L. A. Duhring described, in 1884, a condition, which he considered to represent a distinct form of disease. An attack is generally preceded for several days by intense itching, or a combination of itching and burning sensations. In some cases there are at the same time signs of constitutional disturbance, as chilliness, headache, fever, gastro-intestinal disturbance. The first cutaneous manifestation is an erythema upon which papules develop, and may afterward be transformed into vesicles, bullæ, or pustules. The evolution of these different lesions may be either simultaneous or successive. The most characteristic appearance is that of bullæ situated upon an erythematous base. The disease may attack any portion and may involve almost the entire integument. It has been seen upon the tongue, mucous membrane of the mouth, throat, and nose, and may first make its appearance in the mouth. The severe itching causes extreme restlessness and insomnia. In some instances an outbreak is characterized by the development principally of vesicles or pustules, but multiformity of lesions is the rule, vesicles, bullæ, and pustules being observed in different localities. The lesions vary greatly in size, some being as small as a pea, others as large as a hen's egg. The contents of the vesicles and bullæ are either clear or turbid, and not infrequently become purulent. Papillary growths or cutaneous hemorrhages are sometimes observed. It is remarkable that the slightest pressure may excite a fresh eruption. The erythematous patches are, in the beginning, of a dark-red or purplish color. The disease extends sometimes irregularly and capriciously, at other times with the utmost regularity. The regions of preference of the affection are the upper and lower limbs, and it is particularly apt to develop in the bend of the elbow or knee. The lesions readily rupture or are picked open by scratching, and brownish crusts form, which cover excoriations. After subsidence of the eruption the skin remains for some time infiltrated and pigmented. The process is superficially situated, and cicatrices are never left except as a result of excoriations produced by scratching or in consequence of an outbreak of furuncles, which are not uncommon in dermatitis herpetiformis, especially in the interval of attacks. The pigmentation remains for a long time. Itching is in some cases confined to the affected patches, while in others it is experienced over the entire body. Notwithstanding the severity of the local manifestations the general condition of the patient remains comparatively good, although in some cases there has been general debility and the disease occasionally terminates in death. The disease is essentially of a chronic nature, and exhibits a marked tendency to relapse at the end of some weeks or months. Dermatitis herpetiformis may occur in young infants, and is then described by Leloir and Vidal as a special variety of the disease. In infancy the lesions exhibit less polymorphism, and principally assume the form of papular erythema with vesicles or bullæ, the contents of which are free from pus. Attacks recur during childhood, and most frequently during the summer months. The general health is impaired even before manifestation of the eruption, and pain is a more prominent feature than pruritus. Male children are probably more subject than females to this affection. Toward the age of puberty attacks become less frequent and less severe, and they may entirely disappear during adult life.

The process as described by Duhring bears a close resemblance to hydroa, or pruriginous pemphigus, and they are now generally regarded as identical. From genuine *pemphigus,* dermatitis herpetiformis is distinguished by the polymorphism of the eruption, the intense itching, and the longer duration of individual lesions. It differs from *erythema multiforme* in the prevalence of bullæ, its chronicity, and itching.

**Etiology.**—Dermatitis herpetiformis is probably neurotic in origin, and is largely dependent upon mental depression or anxiety. It is usually associated with evidences of general debility or ill-health. In some cases it is apparently due to malarial infection. When it occurs in pregnant women, it may be symptomatic of an irritable condition of the nervous system, dependent upon impoverished blood. It is possible that the irritation of the nervous system may depend upon toxemia, which may in turn be due to defective excretion by the kidneys, or to some special poison. It may possibly be due to bacterial infection.

No special micro-organism has yet been detected in the lesions, and experiments relative to auto-inoculation have proved negative. It has been observed in connection with pyemia, tuberculosis, and disease of the cerebro-spinal nervous system.

**Treatment.**—This affection is singularly unamenable to treatment, either local or general. Efforts should be directed toward maintaining the strength by a nutritious and easily digestible diet, consisting principally of milk, eggs, fruit and bread, and other unirritating, easily assimilated food. The bodily functions should be regulated and exercise taken in the fresh air. The general health should be built up with tonic remedies, as strycl [illegible] vegetable bitters and phosphorous. Arsenic is of but little, if any, value, though Brocq regards the arsenate of sodium as of advantage, given in increasing doses and pushed to the limits of tolerance. He also mentions ergotin, codliver oil, asafetida, valerian, and belladonna as worthy of trial. The iodide of potassium seems to aggravate the condition. We may have recourse, likewise, to castor or musk, in order to allay restlessness and insomnia. Chloral hydrate, opium, and cannabis Indica have also been given for the same purpose. The hydrobromide of quinine, four to eight grains (0.24 to 0.5 gm.) daily, combined with small doses of extract of belladonna, has also been recommended. Coffee, tea, tobacco, and alcohol should be prohibited, as well as those foods which, like strawberries and shell-fish, have a tendency to produce eruptions upon the skin. On the other hand, a milk-diet is advisable. The activity of the secretions should be sedulously promoted. Topical applications must be of the blandest character. When the disease is very extensive and excoriations are abundant, the continuous warm bath may afford relief, as in a severe case reported by Ravogli. This writer inclines to think that ichthyol, used internally and externally, is of more avail than any other drug. Duhring has sometimes found the employment of sulphur of service. Among other applications which may be used in the local treatment with more or less success may be enumerated lotions containing phenol, menthol, corrosive sublimate, hydrocyanic acid, borax, cocaine, ointments of oxide of zinc, oleate of bismuth, dusting-powders such as starch, talc, oxide of zinc, subnitrate of bismuth, etc. The glycerole of starch, codliver oil alone or with the addition of a small quantity of oil of cade or betanaphthol, may also be used with some benefit.

In cases in which a malarial origin is suspected, quinine may be given in large doses. In those in which nervous depression is the most prominent sympton, the best results can be obtained from the administration of nux vomica and phosphoric acid. Anemic individuals will be benefited by the various chalybeate preparations. According to Crocker,[1] arsenic and belladonna exercise almost a specific effect upon the disease. In a well-marked case which came under my observation, the eruption disappeared rapidly under the administration, after meals, of three minims of Fowler's solution combined with one minim of tinct. opii deodorata and half a minim of tinct. capsici. The intense itching can usually be rapidly relieved by the application of lotions or ointments of phenol and other antipruritics. Secretan has reported a case in which lotions of one-per-cent. carbolized water not only relieved the itching, but were followed by gradual improvement of the lesions.

**Prognosis.**—The prognosis is generally favorable if time be conceded. The eruption usually proves obstinate to treatment, but it finally disappears when the general health improves, or when the source of irritation is removed. Hebra and Kaposi have observed cases of dermatitis herpetiformis which terminated fatally.

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[1] British Medical Journal, May 22, 1886.

Hydroa Vacciniforme.—This is known also as hydroa Alstwall of Bazin, and summer prurigo. It is a vesicular, or bullous eruption, appearing during the summer season, and showing a decided tendency to annual recurrence. It is followed in a few cases by permanent cicatrization, or scarring. It is seen most frequently among males, and begins early in life, disappearing before middle life. This is to be distinguished from the eruption caused by the brown-tail moth.

The lesions appear almost exclusively upon the uncovered regions, especially the face, hands, and arms. The eruption appears first as a red spot or papule, upon which a vesicle slowly gathers and develops. This soon dries and forms a crust, beginning at the centre so as to give an umbilicated appearance, like a vaccine vesicle. Several lesions may coalesce into a large bleb. The disease is marked by repeated outbreaks, and may last several weeks. The crusts, in falling off, may leave a pitting or permanent scar. Exposure to sun and wind may excite fresh eruptions. Hygienic and protective treatment are required. The tendency diminishes and finally disappears as manhood approaches.

## POMPHOLYX.

Synonyms.—Dysidrosis—Cheiro-pompholyx.

Pompholyx is an acute, exudative, cutaneous disease, characterized by the formation of a variable number of deep-seated vesicles, which terminate in a few days by spontaneous rupture or absorption, and are followed by slight desquamation of the epidermis.

**Symptoms.**—The eruption is symmetrical in character, and is usually limited to the sides of the fingers and the palms of the hands. It may, however, appear upon the soles of the feet and other portions of the body. Jamieson has seen a case in which the face and mucous membrane of the mouth and tongue were attacked, in addition to the hands and feet. At first they are minute, isolated, transparent vesicles, deeply imbedded in the skin. They slowly increase in size, and become whitish or opaque, resembling grains of rice or sago beneath the epidermis. The process may be arrested at this stage, and resolution take place by absorption. Generally, however, the exudation continues, the vesicles increase in size and are elevated above the surface, and may even coalesce and form large bullæ. In a few days the fluid begins to disappear by absorption, or the walls of the vesicles and bullæ rupture and the contents escape. More or less desquamation of the epidermis follows, resulting in the exposure of a reddened, abraded, non-discharging surface, which rapidly heals. The eruption is usually accompanied by slight itching and burning, and more or less nervous depression. When the eruption is extensive, it occasions stiffness of the hands and fingers. Pompholyx of the face may cause painful fissures.

**Diagnosis.**—Mild forms of this affection might be mistaken for *sudamina,* but the presence of more or less itching and burning will suffice to make the diagnosis. Severe cases may present a slight resemblance to eczema vesiculosum. In *eczema,* however, the subjective symptoms are more intense, the surrounding surface is hot and erythematous, and the rupture of the vesicles is followed by the formation of crusts and the exposure of an exudative surface.

**Pathology.**—Fox and Crocker believed this affection to be due to retention of sweat and dilatation of the sweat ducts or glands, and termed it dysidrosis. Robinson,[1] however, has shown that these structures are perfectly normal, and that the vesicles are formed by an exudation of serum from the papillary vessels into the deeper layers of the rete mucosum.

**Etiology.**—The etiology of pompholyx is unknown, but it is probably associated with some disturbance of the nervous system. It occurs in those suffering from depressed nutrition and also in those whose general health appears to be good. It is most frequent during adult life and in the summer season. In winter it commonly attacks those who, like cooks, are exposed to the influence of heat.

**Treatment.**—According to Robinson, arsenic exercises almost a specific effect, and, when given in time, will invariably abort the eruption. Full doses of Fowler's solution, or arsenic trioxide, should be given until all traces of the vesicles have disappeared. Quinine, iron, and strychnine, and the mineral acids, will also be found serviceable. A full supply of nourishing food is of the utmost importance.

Locally, any soothing ointment or lotion may be applied to lessen the itching and burning, or to protect the abraded surface.

**Prognosis.**—The prognosis is always favorable. The eruption disappears, with or without treatment, in a few days or weeks, but relapses may occur at intervals.

## ACNE.

**SYNONYMS.—Acne disseminata—Acne vulgaris—Acné boutonneuse—Varus-Hautfénne.**

Acne is an inflammatory disease, involving the sebaceous glands. It is usually chronic in character, and appears in the form of papules, or resulting in the formation of tubercles, pustules, or abscesses, either alone or combined, and affects more particularly the face, neck, chest, or back. It is extremely common, and comprises about eight per cent. of all skin affections.

**Symptoms.**—Acne is one of the most common diseases of the skin, existing either alone or in combination with comedo, or seborrhea. It appears in the form of papules, pustules, tubercles, or nodules, from the size of a pin's-head to a bean, solid or filled with sebaceous material or pus, which are isolated, or arranged in groups or patches. The eruption may occur on any portion of the body excepting the palmar and plantar surfaces, but its chief predilection is for the face, neck, chest, and back, the regions most plentifully provided with sebaceous glands.

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[1] "A Manual of Dermatology," by A R. Robinson, M.D. D. Appleton & Co., New York, 1886.

When acne attacks the face, the forehead, cheeks, and chin are the portions usually involved. It may appear on the face and trunk at the same time. In other instances the trunk, arms, and thighs alone will be the seat of the eruption. Acne, as regards the two sides of the body, is usually symmetrical, but is more or less irregular in its distribution. It is observed in both sexes, especially about the age of puberty. Acne may occur at any time of life, but is rarely seen after youth and middle age.

Acne may be acute or chronic, the latter being the general rule, successive crops of the eruption appearing, disappearing, and reappearing from time to time for many years. The eruption may be mild or severe —consisting in the former case of a few isolated or scattered pale, light or dark-red papules, and, in the latter, of groups or bunches of papules, of various shades of color, with or without a central point of suppuration—with pustules, nodules, and abscesses. The eruption is often accompanied by comedo and seborrhea.

In many cases the disease may be observed at the same time in all its stages, from the retention of secretion to the inflammation and suppuration of the glands. The inflammation may be superficial or deep-seated, giving rise, in the latter event, to the formation of pustules and abscesses, which will leave the skin marked with indelible scars. These scars may be slight or severe, and when the latter occurs the face is very much disfigured. There are several well-marked varieties of the disease.

ACNE PAPULOSA.—In this, the mildest form of acne, the eruption consists of a number of more or less conical, pale-red papules, varying in size from a pin's-head to that of a pea. The lesions are generally mingled with comedones, and are scattered over the face, especially around the forehead.

The centre of the papules may present a darkened appearance, exhibiting the opening of the ducts, blackened by dirt and exposure, forming the condition known as acne punctata. The eruption exhibits different degrees of severity in different individuals, from a few irregularly scattered to many papules, at times associated with pustules in various stages of development. This is also called comedo, grub-worm, etc. In each of the enlarged follicles five or six specimens of demodea folliculorum may be found imbedded in the accumulated sebum. It is not known that this parasite exerts any influence in causing the eruption, however.

ACNE PUSTULOSA.—This is the most frequently observed variety of acne. The lesions vary in size from a pin's-head to a split pea. They are in all stages of development, and are generally associated with papules, papulo-pustules, and at times with seborrhea. The inflammation may be mild or severe, and consequently the amount of suppuration may be slight or abundant, leading to the formation of either small or large pustules. Each pustule contains a drop or more of pus. When the inflammation is severe, abscesses containing a large amount of pus, mixed with bloody serum, develop. The pustules generally form rapidly, and terminate by absorption and desiccation, or burst, and in scabbing over and healing leave behind a slight cicatrix. The pustules are either round or conical in shape, and are surrounded by an inflammatory areola. In some instances neighboring lesions coalesce, lose their hemispherical form, and become oval-shaped. This appearance has been called acne hordeolaris (that is, in the shape of a grain of Scotch barley, *Hordeum Vulgare*).

The larger pustules are frequently attended by pricking and burning sensations, and the abscesses by considerable local pain and tenderness.

If the inflammation be deep-seated and the subcutaneous cellular tissue involved to a considerable extent, the base of the pustule is hard and indolent, and perhaps purplish, with little or no tendency to suppurate. This condition is known as ACNE INDURATA, and is frequently met with on the face, more particularly about the submaxillary region.

In consequence of long-continued congestion of the parts, hypertrophic growth of the connective-tissue may set in, the skin now becomes red, rough, and greasy, the glands enlarge, and small tumors form, giving rise to what is termed ACNE HYPERTROPHICA. At times the acne-spots are succeeded by atrophy of the skin, and they are then named ACNE ATROPHICA.

The eruption, when appearing in strumous, anemic, and tubercular subjects, is known as ACNE CACHECTICORUM. The lesions generally develop on the trunk and extremities, are dark-red, purplish, or violaceous papulo-pustules, of all sizes, and are noted for their indolent and sluggish course.

Under the title ACNE VARIOLIFORMIS, Hebra describes an eruption which attacks the forehead near the margin of the hair, and which may involve the hairy scalp. The lesions are reddish-brown papules, varying in size from a pin's-head to that of a lentil, sometimes surrounded by an inflammatory zone. These papules do not develop in connection with the sebaceous glands. To their summit, a dry, brown crust is closely attached, and so remains for a long time, leaving a cicatrix when it falls. Boeck gives the name ACNE NECROTICA to an eruption of small, shining papules of a pale-red or yellow color, upon which after a time dry, brownish-red crusts form. Large crusts result from a coalescence of many papules, and beneath these crusts the corium is eroded.

ACNE ARTIFICIALIS.—Acne-spots are often developed during the use of various drugs, either internally or externally, as well as by the application of various irritating substances to the skin. Thus, the internal administration of iodine, and of iodide and bromide of potassium is followed, in many persons, by numerous crops of papules on the face, neck, back, chest, and at times on the thighs and arms, which may remain unaltered, or become rapidly changed to pustules. Again, the use of certain cosmetics, powders, and paints, on the face, neck, and chest, resorted to by ladies, or rubbing the same parts with dyed ribbons or flannel, to give an apparently healthy hue to the countenance, will often cause an outbreak of papules and pustules. The enamelled bands of men's hats sometimes give rise to an eruption of acne upon the forehead. The wearing of chest-protectors, bands, and flannel next to the skin, frequently causes an outbreak of papulo-pustules. The use of tar, phenol, and chrysarobin will produce an attack of acne, which will persist until these substances are discontinued. The summits of the papules, in these cases, usually present a black point, corresponding to the duct of the sebaceous gland or hair-follicle, from one or another of the substances having lodged there. The same effect may be observed in those who work among grease, petroleum products, tar, and arsenic preparations, and especially in dyeing establishments where woolen fabrics are colored. In many instances the vapor, coming in contact with the skin, is sufficient to set up an irritation and inflammation of the glands, and the development of acne.

The condition formerly described by some authorities under the title of ACNE SEBACEA is now regarded as being properly classified as *Seborrhea.* An exceptionally chronic form of acne occurring in combination with seborrhea, has been termed by Petrini *acne rubra seborrheica.* It is so designated on account of its color, as it shows a distinct tendency to rosacea, and to the formation of small telangiectases. Illustrations have been recently published by Engman and Mook, of St. Louis.[1]

**Diagnosis.**—The characteristic symptoms of acne are so well marked in the great majority of cases as to make the diagnosis simple and easy. The age of the patient, the situation and chronic course of the eruption, the typical, irregular, scattered or grouped lesions, appearing and disappearing, are significant. It might, however, be confounded with papular, papulo-pustular, or tubercular syphilis, variola, eczema, and rosacea. Syphilis and variola may both assume precisely the same appearance as acne. The examination should, therefore, be made with great care, and an opinion expressed only after a thorough study of the course of the eruption. Acne can be distinguished from *syphilis* by the history and course of the latter, and its tendency to ulceration, and its appearance at the same time in other parts of the body. I have seen subjects, however, in which both affections were commingled, the acne appearing either before or during the eruption of syphilis, and very often hiding the true nature of the latter affection.

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[1] Journal of the American Medical Association, Aug. 31, 1907.

It will be found, upon inquiry in these cases, that iodide of potassium or some medicinal substance, has been taken internally or applied locally and produced the outbreak of acne. The discontinuance, for a time, of the medicine or of the local application used, will enable the physician to say which is the predominating affection.

The chief diagnostic points are contrasted in the following table:

| *Acne.* | *Papulo-Pustular Syphilis.* |
|---|---|
| 1. Specific history negative. | 1. Specific history positive. |
| 2. Eruption limited to the face, as a rule. | 2. Eruption general, and more prominent over the body. |
| 3. Course is chronic and occurs at puberty. | 3. Course acute and after puberty, generally. |
| 4. Lesions are inflammatory. | 4. Lesions are new growths. |
| 5. Lesions red. | 5. Lesions ham-colored. |

| *Acne.* | *Variola.* |
|---|---|
| 1. Constitutional symptoms absent. | 1. Constitutional symptoms present. |
| 2. Eruption papular, followed by pustulation. | 2. Eruption papular, then vesicular, finally pustular and umbilicated. |
| 3. Chills and fever absent. | 3. Chills and fever precede eruption. |

*Variola* differs from acne in its history, course, and constitutional symptoms. The eruption of variola is first papular, then vesicular, and finally pustular. It is acute in character, preceded by a chill, and accompanied by high fever, pains in the back, and other grave symptoms. In acne there are neither vesicles. chill, nor fever, and the eruption pursues a chronic course.

Papular and papulo-pustular *eczema* may simulate acne. In the former the lesions are not necessarily located in the follicles, and scales and an interpapular infiltration are usually observed, which are not present in the latter.

*Rosacea,* although frequently complicated with acne, differs from it in the local congestion which primarily arises without particularly involving the sebaceous glands.

**Pathology.**—Acne is due usually to a folliculitis attended by a retention of the sebum within the hair-follicles and sebaceous glands connected with them, followed by its decomposition, which often leads to a secondary peri-folliculitis. During the first stage, hyperemia, with exudation and emigration of corpuscles, may take place, followed sometimes by a destruction of the follicles and glands. If the inflammation be active, suppuration generally ensues, resulting at times in induration, hypertrophy, and atrophy of the tissues of the parts. In some cases, as Hebra observed, the sebaceous plug is wanting, and the epidermis lining the follicles appears to be abnormally developed, setting up irritation and occasioning inflammation of the parts around. In others, the change may occur alone within the sebaceous glands. The first stage of acne corresponds with the condition already described as comedo. As a rule, the disease is primarily a folliculitis, and as Robinson has noted, differs from sycosis, which begins as a peri-folliculitis.

The vessels which surround the hair-follicle are dilated and engorged. According to Leloir and Vidal,[1] the pus is derived from the adjacent derma. They speak of having seen the distended hair-follicle crowded with epithelial cells but perfectly free from pus, while little collections of pus surround or lay beneath the follicle. Eventually the lining membrane of the follicle is destroyed, and the pus gains entrance to the cavity. The sebaceous gland itself may or may not become involved. These authors consider that acne, in most cases, begins with a peri-folliculitis. In atrophic acne, the hair-follicle and its sebaceous gland are entirely destroyed, their place being taken by a mass of epithelial cells which, to a certain degree, preserves the form of the gland and follicle.

**Etiology.**—Acne appears in both sexes, and can be induced by either constitutional or local irritation. In many instances it arises from some reflex affection. Among the various internal causes are the physiological changes which take place at the period of puberty, a time when the blood-vessels and nerves of the sebaceous glands and the hair-forming apparatus are especially active. Any constitutional or local irritation that may then arise will very often (more than under ordinary circumstances), excite congestion of the parts, lead to the retention of the sebaceous secretion, inflammation, and the development of the disease.

It is under such circumstances that all debilitating conditions, disorders of organs or portions of the economy which have a reflex action on the face (particularly the gastro-intestinal canal, genito-urinary tract, and mental troubles), excite and aggravate it. That mental emotions will affect facial circulation is well shown by the sudden dilatation and contraction of the cutaneous capillaries in blushing and in paling.

Puberty, with the attending physiological changes, therefore, frequently gives rise to acne, especially when some irritation is present, which may continue until the system has passed through this period and has returned to a state of rest.

Again, some persons are born with the organ of the skin naturally weak. The skin is then oily or scaly, or both conditions are combined, from the debility of the glands.

The lymphatic and strumous frequently present this condition of the skin. They are therefore, especially prone to acne, and any reflex irritation will lead to the retention of the sebaceous secretion; the glands become blocked up, and inflammation sets in, often with the formation of pus. The amount of pus production will depend upon the intensity of the inflammation and the state of the constitution. In subjects pres strumous condition, the inflammation is usually severe, the co tissue around the glands is implicated with a free formation of p resulting atrophy or pitting of the surface. In persons of this d the lesions will usually present the appearance of a scrofulous a differing only from ordinary acne by its obstinate and indolent the intense inflammation, the rapid and abundant formation of the tendency to leave behind indelible cicatrices.

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[1] Traité descriptif des Maladies de la Peau, p. 14.

Acne may occur at any period of life; but is most common at It attacks both rich and poor, regardless of nationality, climate, plexion, although those having a light skin are more predispos than those of a dark one. It may be occasioned by debility, chlorosis, or from a derangement of the alimentary canal or genito system.

Experience will point out to every physician that stomac intestinal disorders, especially when attended with constipati ovarian and uterine affections, will, by their reflex action, c appearance. The lesions will abate, to crop out again, depending upon the treatment they receive, whether judicious or otherwise. subjects of acne the eruption is frequently aggravated by dietetic The ingestion of certain articles of food, particularly cheese, sufficient to cause a fresh outbreak of pustules.

Barthélémy, of Paris, lays special stress upon the existe dyspepsia with dilatation of the stomach as a cause of acne. He d that of 169 cases studied within the period of five years, he has detected splashing (*clapotage*), an important sign of dilatation stomach. A seborrhea is first excited in consequence of the ill elabo of aliments in the stomach. The oily, seborrheic skin becom excellent culture-medium for the acne-germ, assuming the existe such a germ (the bacillus acne of Gilchrist). This writer suppose acne, pure and simple, is always papular, and that it is by the co-ope of other germs—generally, according to Gilbert, the staphylococcus —that acne becomes pustular, nodular, phlegmonous, etc. He su the etiology of acne in the following phrase: The interior prepar soil, from the exterior comes the seed.[1] In this connection, it m said that T. Caspar Gilchrist asserts that the pustules of acne vulga not due to the invasion of the ordinary pus organisms; but rathe specific bacillus which he has described. He claims for this organis it has many characteristics wherein it differs from all other bacilli. pathogenic for mice and guinea-pigs. He has suggested for this organism the name bacillus acnes. When the lesions contain cultures the contents are of a jelly-like consistence; but secondar mixed infection give a more creamy character to the pus. Tubercle bacilli, and other common forms of bacteria, are frequently met with in the lesions of acne. The presence of these organisms may lead to secondary destructive or degenerative processes which do not belong properly to acne. Unna and Sabouraud claim that the bacteria which they found in seborrhea are also the active agents in the production of acne. The micro-organisms known to excite suppuration are generally found in pus from the lesions of acne. The form most frequently met with is the staphylococcus albus. The disease may be spread over the face by scratching with the finger-nails.

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[1] Medical Bulletin, May, 1890, p. 172.

Climate has a certain influence in the production of acne, which is more common along the sea-coast than in the interior. Patients will, however, occasionally present themselves in whom the physician will not be able to trace the disease to any assignable cause. Acne may also result, as has already been stated, from the internal use of the iodides, bromides, and other medicinal substances. It may likewise be developed by any local irritation, as uncleanliness, the use of caustics, soaps, tar, phenol, chrysarobin, creosote, powders, paints, and various cosmetics. Those who work among oils, dyes, arsenic, and woolen fabrics are often affected.

Among the causes occasionally productive of acne, Brocq names epilation or the application of depilatory ointments.

**Treatment.**—Although acne is at times a very obstinate affection, nevertheless it can be relieved and cured by good management and patience on the part of both physician and patient. The treatment usually pursued is constitutional and local. With some patients, attention to the general health suffices; with others, direct application alone answers; while in certain instances a combination of both internal and external remedies is required.

Constitutional Treatment.—It is necessary in every case carefully to inquire into the habits of the patient; in fact, to attempt no treatment until it has been satisfactorily settled whether or not the affection is dependent upon an ascertainable exciting cause. The first point should be an examination into the condition of the alimentary canal, to see if a coated tongue, eructations, diarrhea, constipation, or one of the many functional derangements of this part of the economy, which are such prolific sources of acne, is an active factor in producing the affection.

To find the cause and remove the lesions, the practitioner must be proficient in the principles of general medicine, and able to apply a through knowledge of therapeutics to the case under consideration. If the tongue be furred, small doses of the mild chloride of mercury, blue pill, or mercury with chalk, given alone or in combination, occasionally with jalap, or compound extract of colocynth, will be found efficacious for the abnormal state of that organ, as well as for constipation often alternating with diarrhea. The late Professor Joseph Pancoast frequently prescribed, during my service on his clinic, for similar conditions, much advantage, the following:

℞ Pilulæ hydrargyri,
Pulveris jalapæ,
Extracti colocynthidis co. ..........āā gr. xij. 0.72
Olei menthæ piperitæ ................ ♏ j. 0.06
M. Ft. pil. no. xij.
Sig.: One pill, or two when necessary, every second or third n on retiring.

Constipation may also be combated with aloin, podophyllin, cas sagrada, or any one of the numerous vegetable or saline laxatives. W the intestinal canal is torpid, small doses of nux vomica, bellado physostigma, or muscarine, or the use of faradization over the abdo will often afford relief, or entirely remove the constipation. The us the natural mineral waters, especially the Bedford, the Congress Hawthorn Springs of Saratoga; and the Capon Springs of West Virg taken regularly before meals, will be found beneficial in overcoming stipation and in toning up the alimentary canal. In case the patient not go to the springs, it will then be best to have the spring-water procu in bottles or barrels, and taken at home. It is often advantageous combine the internal administration of one of the ferruginous preparati with a natural mineral water, or to give a saline containing a lar quantity of iron, which adds additional vigor to the alimentary canal. a sea-voyage, and residence at Cheltenham in England, Baden-Baden Kissingen in Bavaria, or Carlsbad in Bohemia, and drinking their water will often effect a very happy change. If this is impracticable, benefici results may be obtained by taking, at home, before meals, the miner waters of these places, imported in bottles, but they should be drunk in regular and systematic manner; the Carlsbad in particular being not for curing many derangements of the digestive tract. The use of stew fruits for their laxative effects is also of benefit.

The following prescription has proved beneficial in many under care, suffering from acne due to stomachic and intestinal disorders:

℞ Tincturæ nucis vomicæ ............. ♏ lxxx. 4.8
Tincturæ coptis trifolia ......q. s. ad f℥iv. 128.
M. Sig.: Two teaspoonfuls in water half an hour before meals

The tincture of burdock-seed, combined with the tincture of go thread and ignatia, also forms a most excellent tonic, and acts beneficial on the glands of the skin.

Extract of nux vomica is another remedy which I have employed wi much satisfaction in those cases which are obviously linked with dietet errors. This drug fulfils a number of important indications in t management of acne. It stimulates the appetite, improves digestion, be gastric and intestinal, promotes intestinal secretion and peristalsis, and acts as a gentle laxative. Moreover, it exerts a peculiar selective influence upon the sebaceous glands, correcting both the quantity and quality of their secretion when disordered, softening the sebaceous plug and facilitating its expulsion, and therefore indirectly favoring the subsidence of the inflammation in and around the glands. I am usually accustomed to administer the fluid extract in doses of five to thirty drops in water just before meals. Betanaphthol, likewise, as an agent powerful in securing intestinal antisepsis, is a valuable constitutional remedy in the treatment of acne.

In other cases, where there is much acidity, the subnitrate of bismuth, in ten-grain (0.60 gm.) doses, can be employed with decided benefit. When it is desired to give the bismuth in a mixture, the following prescription is of service:

| | | |
|---|---|---|
| ℞ Bismuthi subnitratis | ʒij. | 8. |
| Pulveris myristicæ | gr. xl. | 2.40 |
| Syrupi zingiberis | f℥iij. | 96. |

M. Sig.: Two teaspoonfuls in water after meals.

An equally good and often preferable preparation contains pepsin, bismuth, and strychnine, which may be given in powder or pill after meals. In scrofulous subjects, and in those who are poorly nourished, the preparations of malt, or codliver oil, either alone or combined, are especially indicated. If the digestive organs are weak, it will be better to give dilute phosphoric acid with the compound tincture or elixir of cinchona, or with codliver oil. The hypophosphites and phosphates, in this same class of patients, and in those who are pale, with loss of appetite and lack of vigor, certainly prove efficacious.

Quinine and strychnine are likewise beneficial, improving the appetite, digestion and general strength.

The preparations of sulphur and arsenic can frequently be given with excellent results. The first can be used in the form of the sulphide of calcium,[1] as recommended by Ringer, in from one-tenth to one-half grain (0.006 to 0.03 gm.) four times daily.

The continued use of five-grain (0.30 gm.) doses of precipitated or washed sulphur, given in milk or capsules, or the same quantity made into a lozenge, with one grain (0.06 gm.) of cream of tartar, as suggested by Garrod, will also be found beneficial in many cases. This remedy acts favorably upon the biliary and intestinal secretions, stimulates the muscular coat of the bowel, and is therefore an efficacious depurant.

Unna is fond of using ichthyol internally in acne, but the virtues of this substance principally depend upon the sulphur which it contains, and I have found it frequently irritating to the gastro-intestinal canal.

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[1] For further research on this remedy, see "Report of Committee on Restoratives, of the Therapeutic Society of New York, on the Use of the Calcium Sulphide as an Antisuppurative." New York, April 24, 1882.

Arsenic trioxide can be used, either in pill form, or given as the liquor acidi arsenici or liquor potassii arsenitis, in one or two drop doses before meals. It is a valuable agent in relieving certain forms of dyspepsia, particularly chronic gastric catarrh, chlorosis, and anemia, and will thus often, after benefiting or curing one or another of these affections that may be present, also completely eradicate acne. It may be prescribed as follows:

| | | |
|---|---|---|
| ℞ Liq. acidi arsenici | ♏ iij. | |
| Strychninæ sulphatis | gr. $\frac{1}{60}$. | |
| Acidi hydrochlorici dil. | ♏ x. | |
| Pepsinæ glycerini | f℥ij. | M. |

This quantity for a dose, to be taken in water, after each meal. Piffard has derived good results from the use of bromide of arsenic in small doses. The chlorate of potassium is a serviceable constitutional remedy in acne, and checks the tendency to suppuration. It is stated by Gubler, of Paris, that glycerin, in acne punctata, will sometimes be found useful. In some cases of acne very good results have been yielded by the administration of ergot, as suggested by Denslow; one-half drachm (2 gm.) of the fluid extract, or three grains (0.18 gm.) of ergotin, are given three times a day. According to Dr. G. H. Fox, it succeeds best in lymphatic subjects in whom the skin is thick and pasty and the circulation sluggish. Professor Hardy recommends the administration of 30 grains (2 gm.) of chloride of sodium daily in severe and obstinate cases of acne indurata.

Young adults suffering with derangements of the genital organs should have, if possible, all such irritation removed by suitable advice and treatment, and be advised to gratify their sexual desires by marriage, after being completely cured. The passage of a cold steel urethral sound twice a week is serviceable in some cases.

Young women having uterine and ovarian affections, being usually those that are anemic and debilitated from leading a sedentary or a gay or dissipated life, or one of over-work in schools, stores, or machine-rooms, need, above all things, a complete change in their mode of living, and should take iron, quinine, or strychnine, or one of the many bitter tonics. Treatment addressed to the uterine disorder may be required, and the hot vaginal douche is sometimes of value in chronic cases. The disease in some may be so severe as to require a uterine examination and appropriate local applications.

Hygienic measures are of the utmost importance in acne, especially in scrofulous subjects. The general surface of the body should be bathed frequently, to promote a more healthy and vigorous action of the skin. Cold water is to be used, when there is no counter-indication, by either sponging the surface, or by the cold douche, or by immersion of the entire body. Many are not able to bear cold water in one or other of the forms just suggested, and with such the warm, hot, or vapor bath may be substituted. Moderate and regular exercise in the open air during sunlight, either walking, riding, driving, boating, skating, or in taking sun-baths, will have the happiest effect in bringing about a cure.

By far the most important consideration in treating the disease, is the selection and use of proper food. During youth, when there is such a physiological activity of the glands, blood-vessels, and nerves, there is active waste and repair taking place in the economy. It therefore behooves acne subjects to be abundantly supplied with food that is rich in nitrogen and inorganic constituents, to meet the demand of the growing body. Food that is indigestible and unwholesome, such as pastries, jams, sweetmeats, pickles, and cheese, should always be avoided. Excessive quantities of butter, cream and eggs are especially harmful in these cases. Alcoholic drinks are to be prohibited. Only plain, well cooked nutritious foods should be taken.

The health and functions of the skin in acne may be decidedly promoted by the employment of electricity and by the practice of massage. The use of these agents has a stimulating and corrective influence upon the sebaceous glands, and they may be very beneficially employed in acne, especially when the disease presents itself in the stubborn form of acne indurata, or occurs in a markedly debilitated subject.

Massage performed daily along the course of the large intestine is also to be recommended. This manipulation materially assists the action of medicines given to act upon the gastro-intestinal secretions.

It is of importance, moreover, that the feet should be kept warm, as patients with acne are habitually troubled with cold feet. The usual means of stimulating local circulation should be employed, as by walking, massage, foot-baths impregnated with salt or mustard, flagellation with hot and cold water, frictions with camphorated alcohol, etc.

LOCAL TREATMENT.—As acne is an inflammatory affection, due to an irritation, the local treatment should first be directed to the removal of this irritation, after which the parts should be soothed, and the congestion relieved with appropriate remedies. A very simple and appropriate remedy consists in the application of hot water to the parts, advising that it should be as hot as the patient can bear; the addition of a small quantity of starch, or borax, or both, can be made to the water when the congestion is very great.

The systematic use of hot water is, in fact, an excellent topical remedy in this disease. The application may be made two or three times a day for about five minutes at a time, and may be made by means of a sponge, or a soft handkerchief. A cheap and convenient little instrument for the application of hot water has been devised by Dr. Leviseur, of New

York. It consists essentially of a glass test-tube fitted to a holder. The tube is half filled with cold water and its opening tightly plugged with absorbent cotton. Reversing the tube the pressure and adhesion of the water holds the cotton firmly in place. The holder with the cotton is then dipped in hot water and can be exactly expressed upon the area of disease.

After the use of the hot water, Brocq advises touching the lesions with absorbent cotton which has been dipped in equal parts of hot water and eau de Cologne, or camphorated alcohol, the latter of which he esteems more generally efficacious. The quantity of water is gradually lessened until the alcoholic lotions can be borne without dilution. Alcohol containing one-thirtieth of salycilic acid (or three per cent.) has also been recommended.

In the early stages of the affection, I usually prescribe applications of the ointment of the oleate of lead, or the ointment of the oleate of bismuth, or zinc, adding at times arrow-root, mercury, creosote, or morphine, as in the following combination:

| | | |
|---|---|---|
| ℞ Unguenti plumbi oleatis | ʒij. | 8. |
| Pulveris marantæ | gr. xx. | 1.20 |
| Olei olivæ | q. s. | |

M. Ft. unguentum.

Sig.: Apply lightly over the surface.

In case it is necessary to stimulate the lesions, the addition of from ten to thirty grains (0.60 to 2 gm.) of betanaphthol can be advantageously made. Another very good application is:

| | | |
|---|---|---|
| ℞ Unguenti bismuthi oleatis | ʒj. | 4. |

Sig.: Apply night and morning.

An ointment containing iodide of sulphur will often prove beneficial. It is advisable to begin with a strength not exceeding ten grains (0.60 gm.) to the ounce (32 gm.).

If the parts are thickened and indurated, add from one to five grains of betanaphthol. Another excellent combination is:

| | | |
|---|---|---|
| ℞ Unguenti zinci oleatis | ʒij. | 8. |
| Betanaphthol | gr. ij. | 0.12 |
| Pulveris marantæ | ʒss. | 2. |
| Cerati simplicis | ʒij. | 8. |

M. Sig.: Apply frequently to the parts.

Many other medicinal substances of a soothing or stimulating nature, according to the indications, can be beneficially combined with the above oleates. Soothing lotions may also be used in some cases, and are often more acceptable than ointments. I occasionally recommend:

| | | |
|---|---|---|
| ℞ Atropinæ sulphatis | gr. ss. | 0.03 |
| Pulveris sodii biboratis | ʒjss. | 6. |
| Aquæ rosæ | f℥iv. | 128. |

M. Sig.: Sponge over the surface.

Again, I often use:

| | | |
|---|---|---|
| ℞ Liquoris plumbi subacetatis dilut. | ℥ij. | 64. |
| Aquæ sambuci flor. | f℥ij. | 64. |

M. Sig.: Saturate an old piece of muslin, and apply for a short time, night and morning.

The following will also be found beneficial:

| | | |
|---|---|---|
| ℞ Acidi borici | ʒiij. | 12. |
| Aquæ aurantii flor. | f℥ij. | 64. |
| Aquæ rosæ | f℥ij. | 64. |

M. Sig.: Use externally.

Barthélémy recommends phenolized and sulphurated pastes, paints of camphorated naphthol, or atomization with ether holding in saturated solution camphorated tannin, salicylic acid, or iodoform. For stubborn cases the following formula is employed in Lassar's clinic:

| | | |
|---|---|---|
| ℞ Pulv. cretæ albæ | 5.0 | |
| Betanaphthol, | | |
| Camphoræ, | | |
| Petrolati | āā 10.0 | |
| Sapon. mollis | 15. | |
| Sulphur precipitat. | 50. | M. |

The above preparation should not be left upon the skin more than fifteen minutes, on account of the irritant properties of the camphor. Another useful formula is:

| | |
|---|---|
| ℞ Resorcinolis, | |
| Zinci oxid | āā 5.0 |
| Petrolati | 10.0 M. |

In many cases where large portions of the body are covered with the eruption, it is of great value, either to soothe or slightly stimulate the lesions by the addition of a medicinal substance. I frequently use with advantage a steam, medicated, or liquid bath. The last can be made emollient by the addition of starch or linseed; alkaline, by bicarbonate or biborate of sodium; and converted into an acid or iodine bath, by the addition of one or the other to the water. Medical vapor-baths of sulphur, mercury, and betanaphthol have likewise proved of service. Soap may also be used with the bath, either alone or combined with such drugs as sulphur, tar, mercury, phenol, betanaphthol, thymol, and chamomile. Dr. H. S. Purdon reports good results from washing the affected part at night with the oil of amber, removing it the next morning with soap and hot water.

Mr. James Startin describes a method by which, in addition to dietetic and medicinal treatment, he has obtained good results. It consists in applying, to the diseased area, a plain or medicated steam bath by means of an apparatus similar to the familiar atomizer, or phenol spray-producer, but smaller. As soon as steam is produced it can be applied at about a foot and a half from the patient for twenty minutes or half an hour. Its action is similar to that of the Turkish bath; it is refreshing to the skin, beneficial to the complexion and speedily removes comedones. A method introduced by Dr. Walter Smith, often attended by satisfactory results, consists in touching each pustule with a drop of liquefied phenol and then covering with collodion.

If a simple case should not yield to the foregoing treatment, I then resort to the use of mechanical remedy by puncturing all the papules and pustules, and scooping out the sebaceous plugs with the needle-knife which I described in 1878. This knife is like a fine needle, having flat sides pointed upon the extremity, and presenting the appearance of a spear. Each papule, pustule, or abscess is punctured by inserting the needle-knife perpendicularly; the blood and broken-down sebum will then readily flow from most of them. Occasionally the accumulated sebum manifests a tendency to remain, but gentle pressure at the sides of the lesion will usually bring it away. It will likewise be necessary to nick the sides of the dilated follicles that contain plugs, pass the needle down, and scoop out the sebum. The use of this needle-knife will free the follicles and delicate tissue of a substance that acts as an irritant, and deplete the skin. It will also relieve stagnation, and awaken the action of the absorbents so that applications can be more effective when used on the parts. This operation not only accomplishes the purposes just set forth, but likewise prevents the rupture of the epidermis, discharge of pus, and formation of scars. The lesions, when punctured, or cut in the manner I have described, will always heal nicely, and will not leave any trace of the operation. On the other hand, the means used by some to rid themselves of these acne-spots by squeezing out their contents between the nails or fingers, or pressing over them a watch-key, in order to remove the plug of the sebum, inflicts on the skin a large amount of injury. In intensifies the disease by breaking the epithelium, produces scarring on healing, and leads to disfigurement. Patients in whom these scars have formed, either from neglecting the eruption or resorting to the injurious habit just mentioned, can be benefited and often cured (when the subject is not too old) by tapping the spots with the needle-knife. After the operation, which should be repeated in three to four days, the lesions should be allowed to bleed freely, and very warm or hot water dashed on the surface to favor as much as possible a copious flow of blood. It is well also to wash the surface with a disinfectant, such as a 1-to-1,000 corrrosive-sublimate solution, a phenol dilution, hydrogen dioxide, or a solution of resorcin. The parts are then to be mopped dry with an old towel or piece of muslin, and one of the soothing oleates or lotions previously recommended lightly applied over the surface. In extremely obstinate cases it is well to have recourse to electro-cautery.

The use of stimulating remedies, such as sulphur, mercurials, alcohol, the distilled water and the tincture of witch-hazel, etc., separately or in combination with other substances, is at times serviceable. The hydrochloride of hydrastinine is also a useful remedy when a mild stimulant is required, made into an ointment in the strength of 10 or 20 grains (0.60 to 1.20 gm.) to the ounce (32 gm.). Both alpha- and betanaphthol are valuable in sluggish cases. They may be employed in the form of a lotion, being slightly soluble in water, or may be incorporated in lard in the proportion of 10 grains (0.60 gm.) or more to the ounce (32 gm.). Occasionally patients will present themselves who can not at once be induced to try the mechanical treatment. In such instances, which are very rare, if the soothing remedies with or without the baths will not succeed, I then resort to an ointment composed of:

| | | | |
|---|---|---|---|
| ℞ Sulphuris sublimati | ʒj. | 4. | |
| Zinci carbonat. | ʒij. | 8. | |
| Betanaphthol | gr. ij. | 0.12 | |
| Adipis recentis | ℥j. | 32. | M. |

The following prescription may be applied with advantage:

| | | | |
|---|---|---|---|
| ℞ Sulphuris sublimati | ʒj. | 4. | |
| Olei anthemidis | ♏ x. | 0.60 | |
| Zinci oleatis | ʒj. | 4. | |
| Adipis recentis | ℥j. | 32. | M. |

| | | | |
|---|---|---|---|
| ℞ Olei eucalypti | ♏ iv. | 0.24 | |
| Zinci carbonat | ʒj. | 4. | |
| Ungt. sulphuris iodid. | ℥ss. | 16. | M. |

Stimulating substances may be employed in the form of lotions, viz.:

| | | |
|---|---|---|
| ℞ Sulphuris sublimati | ʒij. | 8. |
| Ætheris sulphuris, | | |
| Spiritus vini rectificati | āā f℥ij. | 64. |

M. Sig.: Shake well, and mop over the surface.

Again, the use of the following formula will give gratifying results:

| | | |
|---|---|---|
| ℞ Hydrargyri chlor. corros. | gr. ij. | 0.12 |
| Aquæ hamamelidis | f℥ss. | 16. |
| Aquæ rosæ | f℥vss. | 176. |

M. Sig.: Apply over the face on retiring. Shake the vial before using.

Renaut recommends a preparation thus composed:

| | | |
|---|---|---|
| ℞ Hydrarg. chlor. corros., | | |
| Ammonii chlorid. | āā | 0.1 |
| Emuls. amygdal amar. | | 200. |

M. Sig.: To be applied morning and evening.

A favorite formula at the Hôpital de Saint-Louis is:

| | |
|---|---|
| ℞ Sulphuris precip. | 15 to 30 gm. |
| Spiritus camphoræ | 30 gm. |
| Aquæ rosæ | 100 " |
| Aquæ destillat. | 150 " M. |

Instead of sulphur, we may use ichthyol, so highly lauded by U This substance may be applied as a lotion dissolved in alcohol and eth as an ointment. For indurated acne, the following combination m of service:

| | | |
|---|---|---|
| ℞ Calaminæ prep. | ʒj. | 4. |
| Iodol | gr. xx. | 1.20 |
| Ichthyolis | ʒjss. | 6. |
| Adipis | ℥j. | 32. |

M. Ft. ungt.

Among many other substances employed in ointment form a English sulphur hypochloride, potassium sulphide, the mild chlorid biniodide, and the ammonio-chloride of mercury ointment of v strengths, the mercurial plaster, as recommended by Neumann, plaster made of salicylic acid and gutta-percha, applied on strips of The sulphate or acetate of copper, the oleate of copper in the form 10 to 20 per cent. ointment, erythroxylon coca (gr. xxx-℥j) (2 to 32 hamamelis, and iodide of lead are applicable to certain cases. The may be said of glycerin, brushed upon the papules or pustules. acid has been found beneficial in chronic indurated acne, and Piffar seen improvement in some cases from the application of a mixtu quillaia with glycerin. The iodo-sulphate of cinchonine, a recently duced non-toxic antiseptic powder, containing 50 per cent. of iodine, value in chronic acne, and I have witnessed good results from an oint of 20 grains (1.30 gm.) of this substance rubbed up with an ounce (32 of oxide of zinc ointment. Another method of treating acne locally, dust the lesions freely with sulphur and other stimulating powders should, however, be remembered that if sulphur, or any of its salt applied with a mercurial, the sulphide of mercury will form on the filling up the follicles with black points and causing disfigurement o countenance. I have been consulted by persons who have been disfig by these applications, and, for removal, have advised the sponging o skin with a solution of boric acid. Chrysarobin, phenol, and salicylic acid ointments have been recommended by different writers. An ointment containing hydrastinine hydrochloride, thymol, or iodide of sulphur is also of service. The same may be said of the official alkaline sulphur ointment. I have used the following combination with success:

℞ Sulphuris sublimati ........................gr. xx.
Creosoti (beechwood) ..................... ♏ xv.
Ungt. zinci oxidi,
Ungt. aquæ rosæ ........................āā ʒss.
M. Sig.: Rub in well, night and morning.

The soap treatment of acne, which was recommended and so largely used by Hebra in the form of his alcoholic solution of soap—the official tincture of green soap—consists in vigorously rubbing the affected part with the alcoholic solution of the potash soap, and is efficacious with some patients, particularly those having a thick and tough skin. For the majority of Americans, whose epidermic covering is usually soft and delicate, I have found less powerful stimulants sufficient. In rebellious cases, Fournier advises friction with the oil of cade, or the application of Vigo's plaster.

Some authorities touch the acne spots with tincture of iodine, tincture of cantharides, the acid nitrate of mercury, and other caustics, but I have never seen any good results follow their use. They are even more severe than the alcoholic solution of soap, and when employed will at times run off on the surrounding skin, producing great pain and distress.

Ellinger[1] strongly recommends for acne, frictions of the skin with fine sand. It should be free from dust, and the grains almost as large as a poppy-seed. The skin should be washed with ordinary soap and water, after which the affected parts are to be rubbed for a short time with the sand slightly wet. After this procedure any adhering particles must be sponged or brushed away. Jacquet[2] insists upon the importance of improvement of the digestive organs by thorough mastication of the food; and, he recommends massage locally. By adopting these simple measures, he claims to have obtained remarkable results.

I have had good results in obstinate cases of acne from the frequent local applications of electricity, either in the form of the faradic, galvanic, or static currents. The judicious use of the x-rays is particularly beneficial in acne indurata, and also in rosacea. A combination of curettage and radiation may be necessary on alternate days. Care must be taken not to produce destructive dermatitis, or atrophy, or initiate slowly progressive changes, which may lead to malignant growth in the future. In brunette subjects, pigmentation is apt to follow. The lanugo hairs drop out early in the treatment.

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[1] Wiener med. Wochenschrift, No. 45, 1876.

[2] Bulletin de Thérapeutique Medico-Chirurgicale.

**Prognosis.**—Acne, although one of the most obstinate and relapsing of the skin affections, can either be limited or cured by remedies, or may terminate spontaneously after the individual has passed beyond the age of puberty, and the system is in a state of repose. The prognosis is, therefore, always favorable, but an early cure can seldom be promised.

The probable duration of the disease—an inquiry usually made of physicians—will largely depend upon the exciting cause, the amount of the eruption, and the habits and occupation of the subject. Simple acne, with a small number of papules and pustules, and those due to external irritants, can often be rapidly cured by mild treatment and a removal of the exciting cause.

Acne indurata and acne cachecticorum, occurring in the debilitated and scrofulous, accompanied with many lesions, often last for years, and are followed by much scarring, and relapse with the least indiscretion or neglect.

## ROSACEA.

**SYNONYMS.—Acne rosacea—Gutta rosacea—Couperose.**

Rosacea[1] is a chronic inflammatory disease of the face, characterized by vivid redness, due to an enlargement of the capillary blood-vessels, and later by hypertrophy of the subcutaneous cellular tissue. It is commonly associated with gastro-intestinal septic disorders.

**Symptoms.**—Rosacea usually attacks the nose, cheeks, forehead, and chin. In rare cases it may affect the entire face, and also involve the scalp and the neck.

Bazin speaks of having once seen rosacea develop in the groin. This disease is confined to the hairless portions of the face, and is, consequently, more common upon the chin in women than in men, and only appears upon the bald scalp. It may present three stages—the congestive, varicose, and hypertrophic. It may not, however, run successively through all of them. Rosacea is a chronic and obstinate affection, beginning in one or another of the above forms, remaining for months or years in that condition, or passing on to the most advanced. The first stage consists in an intense reddening of the nose, at times the same condition existing on the cheeks, forehead, or chin, without either swelling or tension of the parts. This redness will disappear on pressure, to reappear upon its removal. Rosacea will be seen on close inspection to be due to an engorgement of the blood-vessels. The enlarged and tortuous vessels are particularly apparent upon the sides and bridge of the nose. It is, however, more common for rosacea to occur alone upon the nose, but it may also be found occasionally

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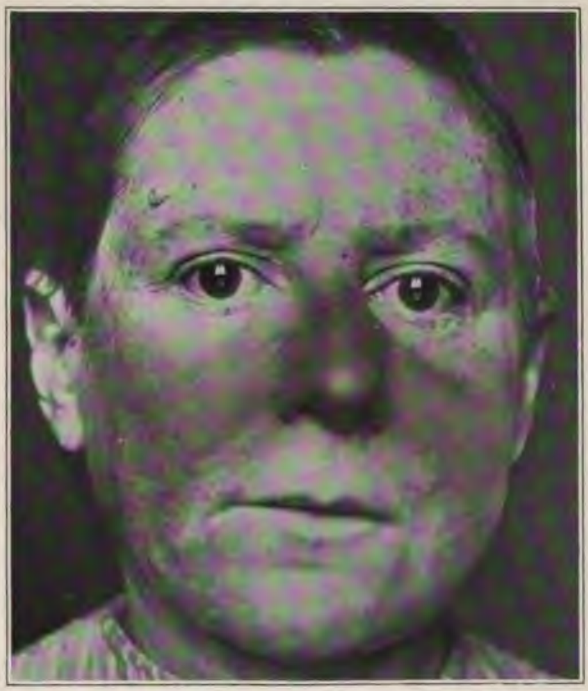
[1] This description of the disease is based upon my paper on "Rosacea" in the Transactions of the Medical Society of the State of Pennsylvania, vol. xii, 1878.

PLATE XVI



Acne Rosacea. (See page 512)

isolated on the cheeks, forehead, and lips. It may either be uniformly distributed over the part involved, or appear as small patches with normal skin between them. The disease usually begins in the form of spots and spreads until the most prominent portion of the face is covered by a diffuse redness, which when exposed to the cold assumes a livid tint. The definite establishment of the first stage is preceded, during an indeterminate period, by attacks of erythema upon the nose or cheeks. These attacks are of temporary duration, and generally occur during or after a meal. They may also be excited by exposure to a strong or cold wind.

Sometimes, owing to the excessive vascularity of the part, the sebaceous glands are excited, and rapidly accumulate and discharge oily sebum. The nose will then have, in addition to the redness, an oily and shining aspect, and the patient will complain, especially after meals, or after walking against the wind, or from exposure to cold, of a warm sensation in the parts. The progress of the disease in the majority of cases is very slow, often requiring months, and even years, for its development. Rosacea occasionally, however, runs rapidly through the different stages, this being generally due to the condition of the system and the violence of the exciting cause. It may continue in the first stage for an indefinite period, but this is more frequently succeeded by the next, in which small capillary blood-vessels appear upon the surface. The skin now remains constantly injected, and the superficial vessels become tortuous and varicose. The vessels may be fine or thick in calibre, and usually run in an irregular manner. The integument thickens, and as the disease encroaches upon the glands it causes inflammation, suppuration, and the formation of scattered papules and pustules. The habitually injected skin, covered with papules or pustules, and the enlarged features, cause great mental distress, especially in females. The disease, which at first involved only the nose, may now extend to the cheeks, forehead, chin, and at last cover the whole face. The redness may no longer remain uniform, but it may become livid in hue where there are papules and pustules. The skin in this stage is often rough and granulated, giving to the patient a very repulsive appearance. The second stage, like the first, is usually very slow in its development, and the affection may not pass beyond it.

The morbid action may, however, in some rare cases, still continue, more especially in men, until either the subcutaneous cellular tissue undergoes successive hypertrophy, or the glands and blood-vessels become distended and enlarged.

In one form of the disease the blood-vessels become enormously distended, the skin has a greasy and shining appearance, the temperature of the nose is lowered, and it is cold to the touch. In another form the skin between the blood-vessels is very much thickened, and of a dark-purple color. In the most severe form of the third stage, tubercular elevations, or a lobulated condition, livid in color, may also appear on the nose, owing to the thickening and hypertrophy of the parts. Noses having these pendulous masses seriously alter the appearance of the countenance, and have been termed rhinophyma. Fluellen's allusion, in Shakespeare's "King Henry V.," to Bardolph's countenance, aptly expresses in the following words the distortion of this stage: "His face is all bubukles, and welks, and knobs, and flames of fire; and his lips plows at his nose, and it is like a coal of fire, sometimes plue and sometimes red." In a case under my observation some years ago—an old English brandy-drinker—the nose assumed, as Hebra has expressed it, the form of a clapper of a bell; the excrescences were enormous, the sebaceous glands very large and filled with plugs of sebum; the skin was almost purple and cold to the touch. The nose has been known to acquire the size of two fists, and hang down in front of the mouth as far as the chin. In these extreme cases the hypertrophy may cause decided inconvenience, as in a case described by Ohmann-Dumesnil, where the mass produced marked stenosis of the nostrils, necessitating respiration by the mouth. The pressure of pendulous tissue upon the upper lip also rendered speech somewhat indistinct. The hypertrophic form is restricted almost exclusively to males.

**Diagnosis.**—Rosacea can be diagnosed by its history, course, and the alterations in the skin. It may be distinguished from *acne* by the increased vascularity in the former affection, its persistence, the varicose condition of the blood-vessels, the thickening of the integument, and its limitation to the face. Acne, on the other hand, when present as the primary disease, is simply an acute inflammation of the glands and follicles, and is not confined to the face.

Rosacea may likewise be mistaken for syphilis or lupus; but such an error should not occur, and, to avoid it, the following diagnostic points will be given between these affections: *Syphilis* is attended with a history; it is preceded by *malaise*, sore throat, and the roseolous rash, and usually attacks one side of the nose. Syphilitic tubercles and pustules do not involve the cutaneous glands; they are rarely developed alone on the face; have a dull, coppery color, and may be complicated with fissures, ulceration, or the formation of crusts. Again, they are usually larger and more firm than in rosacea. In rosacea there is no syphilitic history, nor any of the concomitants of specific disease. As a rule, the disease involves first the end of the nose, and the color of the patches is a vivid red from the enlarged and tortuous blood-vessels, which are absent in syphilis. The pustules and tubercles of rosacea are of a bright tint, and have their seat in the glands of the face, but do not ulcerate or form fissures or crusts.

*Lupus erythematosus* may be mistaken for rosacea. The surface of the diseased patches in lupus erythematosus is covered with fine yellowish scales, adherent to the follicles beneath, which are not present in rosacea.

The margins of a patch of erythematous lupus are more distinctly marked, its color is usually a brighter red, it exhibits some tenderness upon pressure, projects slightly above the level of the surrounding skin, and the cicatriform spots are distinctive. Lupus vulgaris may bear a resemblance to rosacea. In lupus vulgaris the well-known papules, tubercles, and scales are present; ulceration occurs, and cicatrices result. In rosacea no scales are present; the part is covered with varicose blood-vessels, the tubercles never ulcerate, and no attempt is made at the formation of cicatrices. The following table gives the chief diagnostic features of the preceding, in comparison with rosacea:

| *Rosacea.* | *Acne.* |
|---|---|
| 1. Redness more profuse. | 1. Redness confined to papules. |
| 2. Papules absent. | 2. Papules and tubercles present. |
| 3. Varicosity of blood-vessels. | 3. No varicosity of blood-vessels. |
| 4. Hypertrophy and infiltration of the skin. | 4. No hypertrophy and infiltration of the skin. |
| 5. Confined to face only. | 5. Not confined to the face. |
| 6. Disease of the blood-vessels in the part involved. | 6. Disease of the glands and follicles in diseased parts. |

| *Rosacea.* | *Syphilis.* |
|---|---|
| 1. Absence of history. | 1. History of exposure, followed by chancre. |
| 2. No fever or sore throat. | 2. Attended with fever and sore throat. |
| 3. Absence of malaise and roseolous rash. | 3. Malaise and roseolous rash. |
| 4. Attacks both sides of the nose. | 4. Usually attacks one side of the nose. |
| 5. Color of nose intensely red. | 5. Color, coppery in hue. |

| *Rosacea.* | *Lupus Erythematosus.* |
|---|---|
| 1. No scales. | 1. Scales present and adherent to the follicles of the glands beneath. |
| 2. Varicose blood-vessels present. | 2. No varicose blood-vessels present in parts involved. |
| 3. Does not ulcerate. | 3. May ulcerate. |
| 4. No cicatrices. | 4. Cicatrices present. |

| *Rosacea.* | *Frost-bite.* |
|---|---|
| 1. Color red. | 1. Color bluish-red. |
| 2. Greasy and not swollen. | 2. Looks shiny and is swollen. |
| 3. Appears gradually. | 3. Appears suddenly after exposure. |
| 4. Not painful. | 4. Painful and itches. |

Hyde[1] refers to a case of *herpes zoster* which he had seen, which involved the nose and resembled rosacea. He adds that the painful character of the disorder, its limitations to one side of the face, its transitory career, with the vesicular lesions, were sufficiently characteristic.

Finally, rosacea may have the appearance of frost-bite. In the latter the parts are bluish-red, shining, and much swollen; in the former the skin is red, greasy, and little or no swelling is present.

**Pathology.**—The anatomical changes in rosacea consist first in congestion of the minute blood-vessels of the parts. The vessels of the deeper portion of the skin are involved from the first. In the second stage the blood-vessels become hypertrophied and permanently dilated, develop seborrhea or acne-spots, and those surrounding the hair-follicles and sebaceous glands become enlarged. An infiltration of lymphoid cells takes place into the tissue surrounding the vessels, and the connective-tissue corpuscles proliferate.

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[1] Hyde's "Diseases of the Skin," Philadelphia, 1883.

This second stage, with the alteration in the blood-vessels, may continue for a long period, improving and again relapsing from time to time, or passing into the third stage, in which there is hypertrophy of the cutaneous glands and tissues of the part, and the growth of a new connective-tissue element.

Hebra has shown an abnormal growth and development of connective-tissue. Piffard[1] found that the horny portion of the epidermis was insufficient; the mucous layer thickened, that the papillæ contained round and fusiform cells, and were enlarged both in length and breadth. The corium had the appearance of a formed tissue, being very much thickened; some of the sebaceous glands were normal, while others were undergoing degenerative changes.

A microscopical examination which I made of a piece cut from the nose of a patient in attendance at the Dispensary for Skin Diseases, Philadelphia, and reported,[2] showed just a vestige of the horny layer of the epidermis, while the mucous layer was very thick. The papillæ were much enlarged, and the blood-vessels markedly dilated and varicose. The subcutaneous cellular tissue was hypertrophied, and the sebaceous glands were degenerated by the pressure of the surrounding tissue.

Leloir and Vidal distinguished two varieties of the hypertrophic form of rosacea. In one, hypertrophy of the sebaceous glands is the most prominent feature. These may attain twelve or fifteen times their normal size. In a second, that to which the name rhinophyma is generally applied, the glandular lesions are entirely secondary. The vessels, and especially the veins, are dilated and engorged, so that in some places they form sinuses and constitute a sort of erectile tissue. The arteries are thickened and sclerotic. In extreme cases the lymphatic vessels are implicated, and a section presents an appearance comparable to that of an angioma or lymphangioma.

**Etiology.**—Rosacea is met with in both sexes, but more frequently in men. It may happen in youth, but it appears mostly in middle or advanced life. In women it may occur about the age of puberty, during uterine and ovarian disorders, and at the cessation of the menses, and will not usually pass beyond the first and rarely to the second stage of the disease. In men rosacea seldom appears before the fortieth year. Heredity has a certain degree of influence in the production of rosacea, and a predisposition to this affection exists in the gouty and rheumatic. Habitual overfeeding with or without constipation is often an exciting cause. Septic conditions of the intestinal contents are likewise a predisposing and an exciting factor of rosacea.

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[1] Archives of Clinical Surgery, vol. i, p. 21.

[2] See Transactions of the Pennsylvania Medical Society, 1878.

The application of cosmetics, paints, and irritating lotions is an immediate cause. I have found these preparations to be productive of the disease in both men and women in the theatrical profession, and in women in the decline of life, notwithstanding all the care that they have taken in applying the cosmetics. Among other of the prominent causes are chlorosis, anemia, excesses of the table leading to dyspepsia, chronic affections of the stomach and intestines, morbid conditions of the liver, and want of cleanliness. The attitude made necessary by certain occupations, which causes an increased flow of blood to the face, is also an inciting factor. Thus we see it in bakers, engineers, etc., who are compelled to work with their faces in proximity to hot fires. In some instances, rosacea is consecutive to acne, the long-continued congestion accompanying repeated attacks of acne at length becoming permanent, and causing dilatation and engorgement of the vessels. The habitual use of vinous, spirituous, and malt liquors is also a common source of the disease. The powerful action of these liquors in producing increased facial circulation, leading to a hideously swollen condition of the nose, can be observed daily. These deformities are commonly known as "grog-blossoms," "brandy-nose," and "wine-nose." Frequent exposure to cold winds often provokes rosacea. In a few cases it is impossible to trace the disease to any external or internal influence.

**Treatment.**—The method of treatment to be employed will largely depend upon the stage and the cause of the affection. The physician should therefore, in all cases, carefully examine into the patient's condition, and, if any constitutional derangement exist, give the appropriate remedies. Women suffering from uterine or ovarian disorders should have the proper treatment to eradicate them. Men who indulge in liquors and dissipation of other forms should be advised to adopt a temperate mode of living. The diet should be plain and substantial, especial care being taken to avoid rich foods of all kinds. It is advisable in some cases to resort to an absolute milk and broth diet, for one or two weeks. It is of extreme importance that the functions of the liver and bowels be properly performed. Alkaline mineral waters may be recommended. Leredde[1] reports that in many cases he has obtained good results from vegetarianism.

In those who are anemic and debilitated, the ferruginous preparations, minute doses of arsenic, codliver oil, the extract of malt, nux vomica, and the dilute phosphoric acid, with bitter tonics, are of great advantage. Those in whom no cause can be traced are often benefited by a change of climate. In women who have depraved health, nervous depression, menstrual disorders, or are at the change of life, and who are often great sufferers from rosacea, with frequent flushing of the face and throbbing of the blood-vessels, the judicious use of the nitrite of amyl, as suggested by Ringer,[1] will often bring relief, either given by inhalation or the stomach, the latter form being usually preferred—two minims dissolved in one drachm (4 gm.) of rectified spirits; the dose of this is from three to five drops on sugar every three hours, the first dose to be taken as soon as the flush appears. When rosacea seems to depend upon the presence of a rheumatic or gouty habit, it may be of advantage to administer an alkali, or advise the use of an alkaline mineral water.

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[1] Revue Pratique, May, 1905.

The following may be used:

| | | |
|---|---|---|
| ℞ | Extracti colchici cormi | gr. v. |
| | Arseni trioxidi | gr. ⅓. |
| | Ferri pyrophosphatis solubilis | gr. xv. |
| | Sulphuris precipitati | gr. xl. |
| | Phenylis salicylatis | ʒj. |

M. Fiant capsulæ No. xx. Sig.: One capsule after each meal.

Under the same circumstances, Brocq speaks favorably of the effects of the following combinations:

| | | |
|---|---|---|
| ℞ | Quinin. hydrobromidi, | |
| | Ergotin | āā 5 cgm. (gr. ¾). |
| | Extracti belladonnæ fol. | 1-2 mgm. (gr. 1/60 to 1/30). |
| | Lithii benzoat | 5 cgm. (gr. ¾). |
| | Glycerini | q. s. |

Ft. in pil. No. j. Mitte tales No. xl.

Two of these pills are given before breakfast and dinner.

| | | |
|---|---|---|
| ℞ | Pulv. digitalis | 5 mgm. (gr. 1/12). |
| | Extract. hamamelidis | 5 mgm. (gr. 1/12). |
| | Extr. gentian., | |
| | Lithii benzoat. | āā 5 cgm. (gr. ¾). |
| | Glycerin | q. s. |

Ft. in pil. No. j. Mitte tales No. xl.

Two pills are ordered to be taken before each meal. Rhubarb or aloes may be added to the above formulæ, according to the indications. The use of electricity and massage will often likewise be found to be valuable adjuvants for their beneficial effects upon the system. Dr. Stein is reported[1] as recommending for acne rosacea the administration of intestinal antiseptics and of remedies which improve digestion. In some cases of acne rosacea Dr. Stein has employed tonogen (an extract of the suprarenal gland prepared by a pharmacist in Budapest) both as a topical and also as an internal remedy, and in a local medical journal he has related some highly satisfactory results obtained by him in this way. The first application of the extract to the affected area of skin caused slight transient hyperemia, which was succeeded by pallor due to the contraction of vessels. The beneficial effects of this local treatment were markedly enhanced by the simultaneous internal administration of the extract in doses commencing with ten centigrammes thrice daily, gradually raised to twenty centigrammes, the dose being reduced on the occurrence of any unpleasant symptoms, such as giddiness or nausea. In cases of moderate severity the combined treatment, modified to suit the individual case, proved very satisfactory, but it was sometimes found necessary to touch greatly enlarged vessels with the electro-cautery.

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[1] Ringer's Handbook of Therapeutics, seventh American edition, p. 370.

The local treatment is, however, important and advantageous in almost all cases. Soothing remedies will answer in some, in others stimulating, and often the addition of one or another of the many mechanical means will modify and frequently arrest the disease. In the first stage, I endeavor by soothing applications to relieve the congestion and allay the irritation. The ointment of the oleate of bismuth, which I suggested in papers read before the Pennsylvania State Medical Society in 1879 and 1882, will often fulfil this purpose. The ointment, lightly pencilled over the surface two or three times daily, will soothe the hyperemic skin, relieve the engorgement of the glands, and bring comfort and ease to the patient. In some, a dusting-powder of either the oleate of zinc, the subnitrate of bismuth, or equal parts of each combined, with powdered starch or arrow-root dusted over the surface after using the ointment of the oleate of bismuth, will not only assist very much the action of the oleate, but will relieve the face of its greasy appearance. Women can in this manner use the above preparations, lightly applied as a cosmetic, to hide the disease in place of one of the many injurious face-powders, and can have the satisfaction of knowing that the application is beneficial, and may cure the disease. The following soothing ointment has also been efficacious in other cases, used either alone or with one of the dusting-powders just named:

| | | |
|---|---|---|
| ℞ Zinci carbonatis | ʒj. | 4. |
| Pulveris marantæ | ʒj. | 4. |
| Hydrargyri ammoniati | gr. x. | 0.60 |
| Unguenti simplicis | ℥j. | 32. |

M. Ft. unguentum.

Soothing lotions are especially effective in some instances:

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[1] The London Correspondent of Budapest in The Lancet, May 23, 1908, p. 1518.

| | | |
|---|---|---|
| ℞ Plumbi acetatis, | | |
| Zinci acetatis | āā gr. x. | 0.60 |
| Aquæ rosæ | f℥iv. | 128. |

M. Sig.: Apply with an old piece of muslin spread over the surface for an hour or two night and morning.

Sulphur ointment may be used with good effect in the first stage, or chrysarobin in solution of gutta-percha, ten grains (0.60 gm.) to the ounce (32 gm.), increasing or diminishing the strength as required.

In the second stage, I have had good results from the fluid extract and tincture of witch-hazel, weak solutions of chloride of zinc, and caustic potash, glycerin, the various mercurials, precipitated sulphur, chrysarobin, and the English hypochloride of sulphur. Some practitioners make use of Vleminckx's solution diluted with five parts of water, which may gradually be withdrawn if the preparation does not provoke irritation. Besnier recommends the following combination:

| | | | |
|---|---|---|---|
| ℞ Sulphur. precip. | 50 | grammes. | |
| Glycerin | 30 | " | |
| Spiritus camphoræ | 80 | " | M. |

Some of these remedies can be used in the form of an ointment, and others as lotions. It is a good plan sometimes, especially when the nose alone is involved, to brush collodion along the course of the blood-vessels, which compresses them, and thus lessens their calibre. In several cases I have obtained excellent results from this method alone. Again, the vapor-bath is valuable both in the first and second stages; it renders the skin soft and smooth, and hastens the absorption of the lesions. Another efficacious application is the oil of ergot, or half an ounce (16 gm.) each of glycerin and oil of ergot, with one drachm (4 gm.) of the extract of belladonna. Unna recommends ichthyol internally and externally. Internally he gives it for a long time, fifteen to thirty grains daily (1 to 2 gm.), and applies it externally in watery solution. He also uses the following ointment:

| | | | |
|---|---|---|---|
| ℞ Ung. zinci oxidi | 20 | grammes. | |
| Pulv. oryzæ | 5 | " | |
| Sulphuris | 2 | " | M. |

More recently Unna has devised an impermeable application which he terms ichthyol-varnish, and recommends it as a decided improvement on his earlier preparations. The formula for this varnish is:

| | | | |
|---|---|---|---|
| ℞ Ichthyolis | 40 | parts. | |
| Amyli | 40 | " | |
| Liquor albuminis | 1-1½ | " | |
| Aquæ | q. s. ad 100 | " | M. |

The varnish is brushed upon the affected skin at night, dries in about two minutes, and can be readily removed by water in the morning.[1] In rebellious cases, Brocq[2] advises the use of green soap, alone or associated with sulphur, betanaphthol, or salicylic acid. Among other applications, which may prove of service, may be mentioned Goulard's extract, solution of sulphate of zinc or of alum, pyrogallic acid, iodized glycerin, and erythroxylon, or cocaine hydrochloride. Natural sulphur baths, whenever obtainable, are of service. A solution of alphanaphthol frequently proves beneficial. The ointment of lead oleate is oftentimes useful, while an ointment of iron oleate is of decided advantage in either the first or second stage.

If the preparations named should fail, poultices and fomentations may next be employed. In obstinate cases I have a good starch-poultice prepared, which is bland and unirritating to the skin, and applied moderately warm, usually just before retiring, and allow it to remain one hour. It is a ready and convenient method of applying a hot bath directly and effectually to the parts. A poultice allays all irritation, burning, flushing, pricking, or pain, limits and checks the inflammation, and abates the tension. It also relaxes the tissue, and renders the absorbents more active in the application of the oleate of bismuth or any other soothing remedy, which should be immediately applied after the removal of the poultice.

All stages of rosacea are, as a rule, materially benefited by the local use of massage and the application of the faradic and galvanic currents. In case the congestion of the skin still lingers and remains obstinate, I puncture the surface with the needle-knife. During the operation I hold the knife in the right hand, and rapidly apply it over the patches, while with the left hand I sponge the surface with hot or very warm water, in order that the bleeding may continue freely. The water applied in this manner will remove the extravasated blood, and will prevent it from clotting in the incisions and obscuring the operation. I always allow the knife to penetrate to various depths according to the thickened condition of the integument. In some points of the diseased patch simple hyperemia may be present, while in others tubercles and excessive hypertrophy may exist; consequently, the former will need very slight punctures, while the latter will require deep incisions according to the amount of hypertrophic growth. In this manner I reach all the larger and smaller patches, relieve the congestion and stagnation, equalize the circulation, and awaken the action of the absorbents, so that local applications may have some effect. This operation should be repeated after an interval of from four to seven days, according to the requirements of the case. After each operation one of the bland and soothing preparations, or one of the astringent and stimulating remedies recommended, can be used much more effectually. Hebra[1] suggests, in treating this affection, the use of an instrument made after the form of a lancet-needle, with cutting edges on both sides, and provided with a stop, so that it may not penetrate too deeply into the derma. He adds that the perpendicular punctures are made for the purpose of destroying the blood-vessels, and that the bleeding can be easily arrested by compressed wadding. Squire operates on rosacea by means of an instrument which he calls the multiple scarifier. It consists of a number of needles attached to a handle, and arranged parallel to one another with a covered shield on each side. He maps out the diseased patches with a solution of black sealing wax, freezes the surface with an ether-spray, and then applies the multiple scarifier. Should the scarifier be too broad for some of the smaller patches, he advises that they be operated on at a subsequent sitting with a single scalpel. The bleeding which follows the use of this instrument, he states, may be copious, but it can be immediately arrested by pressure with the fingers, a layer of wet blotting-paper being interposed between the fingers and the skin pressed. Aube, who recommended linear scarification, believes that it is to be relied upon in rosacea only before the hypertrophy has become far advanced. The same object, it can be seen, is obtained by either of the operations named, but the one I am accustomed to employ appears to be the easiest and simplest for practical use in all respects. The tortuous and varicose blood-vessels may be obliterated by passing into them an ordinary needle heated to redness, by using the galvano-cautery with a fine-pointed needle, or by electrolysis. In the latter method a very fine cambric-needle is selected and connected with the cathode electrode of a galvanic battery of from six to ten cells. The needle is then inserted into the variocose vessel, after which the patient is handed the anode electrode, which completes the circuit; the latter electrode is dropped before withdrawing the needle, which will prevent the patient from experiencing a shock on breaking the circuit. The deformity of the third stage may be reduced by either puncturing deeply the hypertrophic blood-vessels and tissue, by scarification, by using the ordinary needle heated to redness, by electrolysis, by faradization, by the galvano-cautery, or by operative procedure with the knife. Cheadle[2] reports good results from the faradic current. Piffard states that he has obtained very decided shrinkage of hypertrophic noses by the use of the galvanic current. I am in the habit of resorting to the use of galvanism, in the strength of 5 to 10 milliamperes, the cathode being placed upon the diseased spots and the anode at the nape of the neck. Locally I employ an ointment composed of the following:

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[1] Medical Bulletin, July, 1891.

[2] *Op. cit.*

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[1] Wien med. Wochenschrift, January, 1878.

[2] Practitioner, London, July, 1874.

℞ Acidi salicylici ........................ ʒss.
Olei eucalypti ........................ ♏ x.
Creosoti ............................ ♏ v.
Ung. aq. rosæ,
Ung. zinci oxidi ....................āā ℥ss. M.

Some of the ointment should be rubbed into the affected spots after they have been sponged with hot water. When papules and pustules are present, an ointment of ammoniated mercury (grs. x-℥i) stimulates the sebaceous glands and improves the nature of their secretion.

**Prognosis.**—The prognosis depends largely upon the cause of the disease. If the affection has not passed beyond the first or second stages and the exciting cause can be eradicated, it can usually be relieved or cured. The result, however, depends essentially upon the habits of the patient. Rosacea will, at times, in women subside spontaneously, especially after the climacteric period. In the third stage, as a rule, particularly when it is due to bad habits and all kinds of over-indulgences, where a decided change in the tissues has taken place, the results, even under the most experienced practitioners, are not usually favorable.

## SYCOSIS.

SYNONYMS.—Sycosis non-parasitica—Mentagra—Acne mentagra—Folliculitis barbæ—Lichen menti—Bartfinne—Sycosis non-parasitaire.

Sycosis is a non-contagious, inflammatory disease, acute or chronic in its course, involving the hair-follicles, chiefly of the bearded part of the face, and characterized by the formation together of pustules, papules, and perhaps tubercles, usually perforated with hairs, and accompanied by more or less infiltration of the part.

**Symptoms.**—The disease usually occurs on those portions of the face on which the beard, whiskers, and mustache grow, although it may be seen upon other parts of the body supplied with hair. It generally begins on the cheek, chin, or upper lip by the appearance of small, discrete pustules or papules, or both, the lesions being perforated by hairs, which are usually firmly fixed at first, but at a later stage of the disease become loose, and are easily removed. The lesions may appear in successive crops at longer or shorter intervals, and may remain isolated throughout their course, or become crowded together, forming well-marked patches. The pustules or papules may be either flat or conical, varying in size, being usually about that of a millet-seed. The pustules are not generally inclined to rupture, unless there be more or less severe inflammatory action. The surrounding skin is reddened, swollen, and infiltrated; there may be present papulo-pustules and tubercles, and, if the pustules rupture, scales and crusts may also exist. The disease is usually preceded or accompanied by heat, tension, smarting burning [illegible] sionally pricking or painful sensations. Sometimes patients will describe the pain as proceeding along the course of the hair, which traverses the lesion, and refer to it now and then as a hair-pain. Sycosis may commence in some cases within the nostril, or pass up from the upper lip and affect the follicles of the stiff hairs or vibrissæ, the disease becoming excessively obstinate and at times extending to the Schneiderian membrane. In this event the columna that divides the nose becomes swollen and inflamed, the organ itself hot and very painful, upon the slightest movement of it tears flowing from the eyes. The disease, while affecting most commonly the cheeks, chin, and upper lip, may also appear on the scalp, eyebrows, eyelashes, neck, axillæ, and pubic regions. Sycosis may appear in one or more points, and spread until it involves all of the regian invaded, or it may develop simultaneously over all the parts just named.

The character of the disease will also vary considerably, according as the eruption is isolated or confluent. In some the lesions are distinct and few in number, while in others they coalesce, the inflammation penetrates deeply into the derma and subcutaneous cellular tissue, infiltration and thickening are marked, the parts become covered with tubercular elevations, scales, and crusts, and occasionally unhealthy granulations and abscesses appear, with many openings, and the surface becomes extremely tender and painful. If the affection be allowed to progress, the follicles and the tissues of the parts will be destroyed by ulcerative action, leading to permanent scars and loss of hair. Sycosis is modified according to the condition of the hair of the affected part. If the hair is thin and feeble in growth, or if it should be cut close or shaved, the disease can be better seen and managed; on the other hand, if the hair is long, thick, and vigorous in growth, the diseased surface can be seen only by separating the hairs; it will also be difficult to treat until the hair is cut close to the part. When the condition of luxuriant growth exists, the hairs become matted together with poured-out products, giving the countenance a disgusting appearance. The course of the disease is usually chronic, often as the result of being improperly managed, or, more frequently, being over-treated.

**Diagnosis.**—Sycosis is liable to be mistaken for tinea barbæ, ringworm of the face, as it is popularly called, or barbar's itch, as both diseases invade the hair-follicles; but the symptoms of each are distinct and characteristic. The diagnostic signs of pustules, papules, and tubercles, pierced in the centre by hairs in their normal condition, firmly seated in the follicles, except when removed by suppuration or extraction, when the root-end is found to be enlarged and covered with pus, are observed only in sycosis. On the other hand, ringworm, or true barber's itch, is usually ushered in by small red or scurfy patches, the hairs are loosened in the follicles, being brittle, altered in texture, and, as the disease advances, finally break off, producing the characteristic stubbled condition of the surface. In case the disease under consideration is attended by marked inflammatory action, judgment should be suspended until the poured-out products can be examined by the microscope, in order to demonstrate the presence or absence of the fungus. It is also sometimes difficult to distinguish between sycosis and *pustular eczema*. All doubt, however, can be set at rest by the absence of discharge, the perforation of the pustules by hairs, and the limitation of the disease to the parts supplied with hair. Again, should eczema be present, not only may there be a moisture of the surface, the eruption extending to the adjacent parts, but the symptom of itching is usually marked and characteristic. *Syphilitic* or *scrofulous pustules* and tubercles, developed on the hairy parts of the face, might be confounded with sycosis. The former lesions, however, are usually preceded by a history, and accompanied by other evidences of the disease. Further, in specific affections, if crusts be present, upon their removal a well-marked ulcer, with sharpened edges, will be seen, while in sycosis there is little or no loss of integument. *Pustular acne* might resemble the early stage of sycosis, but the lesions are not pierced by hairs, nor is the disease limited to the male in whom the beard has grown.

**Pathology.**—Sycosis, in its early stage, is a peri-follicular inflammation of the skin. While Wertheim[1] and Köbner[2] were the first to invoke the aid of the microscope in determining the nature of this disease, yet they confined themselves to the examination of the extracted hairs only, and not the affected tissue. Subsequently, Robinson examined portions of the skin obtained from a living subject, and showed the changes in the invaded part from the commencement to the termination of the disease. According to the observations of this pathologist, the transuded serum penetrates the hair-follicle, and increases in quantity as the inflammation proceeds. Pus is also poured out, and the follicle-sheaths become softened and more or less destroyed, permitting free ingress of pus into the cavity of the follicle. The cells of the root-sheath and hair-root become swollen and infiltrated with sero-purulent matter and pus-corpuscles, and finally become broken down and separated from the follicle-sheaths, so that the hair lies loose within the follicle, and can be easily extracted. The pus reaches the surface by oozing out between the hair-shaft and the follicle-sheath, or by breaking through the epidermis near the hair. In the majority of cases the follicle-sheaths are more or less destroyed, but the hair-papilla remains uninvolved, and in time produces a new hair. In severe cases the follicle-sheath, root-sheath, hair-root, and hair-papilla are all destroyed, and permanent loss of hair ensues. The sebaceous and sudoriparous glands and other tissues of the skin may also become disintegrated and replaced by cicatricial tissue.

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[1] Zeitschrift der k. k. Gesellschaft der Aerzte, 1861.

[2] Klinische und experimentelle Mittheilungen aus Dermatologie und Syphilologie, Erlangen, 1864.

**Etiology.**—Sycosis is a non-contagious inflammatory affection, usually occurring between the ages of twenty-five and fifty, and is generally due to some constitutional derangement. It is often dependent upon a debilitated state of the system. It is observed among those who are mentally or physically overworked. Sycosis follows the use of unwholesome and unsuitable food, excesses of all kinds, and occasionally appears in individuals convalescing from exhausting diseases. It may be excited by local irritants, as want of cleanliness, and in persons who are subject, particularly by their occupation, to either a high or low temperature. Chronic rhinitis has also been enumerated among the local causes, as well as a faulty relation between the hairs and the follicles in which they are contained. According to Bockhart, the common micro-organisms are of suppuration, the immediate or exciting causes of sycosis.

**Treatment.**—It will be found that the employment of both constitutional and local treatment will yield the best results. Cases treated with only local applications are generally protracted an unusual length of time, and, under such circumstances, it is by a recuperative action of the system that recovery takes place. The *internal treatment* is often advantageously begun with a brisk purge, the use of one of the mercurials, followed by a saline cathartic, being advisable. The diet should be carefully regulated and should consist of easily digestible and nutritious substances. Cheese should be strictly prohibited. The simple bitters, alone or combined with strychnine and a mineral acid, will assist very much, especially in the debilitated or those out of health, in combating the disease. Massage and static electricity are serviceably employed when debility is marked. The fluid extract or the tincture of nux vomica may be given with advantage, while some have observed good results to follow the combined internal and external use of phytolacca. Iron, arsenic, phosphorus, and codliver oil can be beneficially employed. The iodide of iron is particularly serviceable in from two to three grains (0.12 to 0.18 gm.) in pill-form three or four times daily. Another valuable preparation is the liquor arsenici et hydrargyri iodidi as recommended by Tilbury Fox, in from three to ten drops, three times a day, especially if there be much inflammatory thickening of the parts. If there is a tendency to the formation of a large quantity of pus, the phosphates, hypophosphites, calcium sulphide, or potassium chlorate will generally assist in counteracting this condition of the system.

The *local treatment,* which is all-important, requires, in the acute stage, emollient and soothing applications. The hair may be cut short, or may be allowed to remain in the natural condition, providing it will not mask the disease and interfere with the local applications. Shaving, which is usually recommended, is painful, and I have never seen it followed by good results. Scales and crusts, if present, should be removed by oil-dressings or a poultice. As applications, lotions are more agreeable to some patients, either warm or cold, and, such being the case, lead-water and laudanum, weak solutions of witch-hazel, zinc and lead acetate, or of corrosive sublimate, can be used. Oils are likewise effective upon others, especially the oil of ergot, olive oil, with fluid mercury oleate, or codliver oil, alone or combined with arrow-root, zinc or lead carbonate, opium, arnica, or belladonna, lightly pencilled over the surface. Among the serviceable ointments at this stage are the zinc, lead, and bismuth oleates, alone or combined with other agents; calomel or white precipitate, ten grains (0.60 gm.) to the ounce (32 gm.) of cold cream or rose ointment, forms a valuable application. Diachylon ointment, with a few grains of camphor, will also be found efficacious. Sometimes applications that are more stimulating are more effective, especially in the later stages of the disease. One of the very best remedies to use under such circumstances is the ointment of oleate of mercury, of from five to twenty per cent. strength, according to the condition of the parts, and applied alone or in conjunction with other remedies. The ointment of nitrate of mercury, in from one to three drachms (4 to 12 gm.) to the ounce (32 gm.) of zinc ointment, is also useful. Sulphur, tar, betanaphthol, or phenol hydrate, can also be advantageously combined with any of the preparations advised.

Resorcin, ichthyol, corrosive sublimate, salicylic or boric acid may also be beneficially brought into requisition. A two-per-cent. alcoholic solution of pyrogallic acid is recommended by Veill, and a solution of tar in alcohol by Professor Pick, of Prague. The late Dr. McCall Anderson advised, as a convenient application, for use in the daytime, Provan's tragacanth paste, the formula of which is:

| | | | |
|---|---|---|---|
| ℞ Tragacanth | ℥ss. | 16. | |
| Glycerin | f℥ss. | 16. | |
| Sodii boratis | ʒss. | 2. | |
| Aq. destill. | q. s. | | M. |

In addition to the employment of the remedies just suggested, it is often of the utmost value to open the various lesions which may be present with a knife, and to puncture the surface thoroughly, thus relieving the enlarged and congested blood-vessels, allowing the stagnated blood to circulate, the effused serum to escape, and preventing the formation of pus. Depletion is not only useful in the early stage of the disease, in conjunction with other suitable topical remedies, but in the subacute and chronic forms especially; if there is much thickening of the skin, it is followed by decidedly beneficial results.[1]

Epilation, which is resorted to by many physicians to prevent permanent alopecia from resulting, and which is extremely painful, becomes unnecessary if the lesions and parts are thoroughly depleted in the manner described. Depletion also awakens the activity of the absorbents of the parts much better than such heroic agents as green soap, acetic acid, etc., and thus assist the action of the local applications. The abstraction of blood should be resorted to from one to three times a week, the parts encouraged to bleed freely by the use of warm water, then mopped gently dry, and the remedy applied well over the surface. The incisions and punctures usually heal rapidly, the thickening lessens, the symptoms disappear, and a cure is effected without any scar or deformity. Bockhart advises that for some time after active treatment has ceased the patient should wash his face once or twice daily with a one-per-cent. sublimate solution.

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[1] Report of the treatment of a case of Sycosis, by the author, in the Medical and Surgical Reporter, p. 298, October 13, 1877.

**Prognosis.**—Sycosis yields rapidly in some, and in others it is protracted for a long period of time, even months and years. Relapses are common, especially in persons who are subjected to continual local irritation. It is, however, curable when properly managed, but the treatment should be continued until all evidence of the disease has entirely disappeared.

## IMPETIGO.

Impetigo is an acute inflammatory affection, which is characterized by the development of discrete, rounded, elevated pustules, of the size of a split pea or larger, situated upon a base inflamed to some extent, and which disappears without leaving pigmentation or cicatrices.

**Symptoms.**—The eruption may or may not be preceded by mild febrile symptoms. It consists of round, elevated pustules, which are slightly acuminated, but not umbilicated. They are situated upon a somewhat inflamed base, with, in the beginning, a slight surrounding areola. Their contents are sero-purulent, purulent, and very rarely bloody. They present a whitish, yellowish, and occasionally a reddish color. In number they may vary from one to many. The pustules are isolated, and, even if in close proximity, do not incline to coalesce. They do not tend to rupture, but their contents several days after maturity are partially or altogether absorbed, or dry into yellowish or brownish crusts. They may, on the contrary, occasionally be ruptured through friction or picking, in which event a thin purulent secretion escapes, which also dries into crusts. The amount of crusting may be slight or abundant, and after they have fallen off an erythematous surface remains, without pigmentation or scar. The disease has an acute course, the eruption generally appearing suddenly. The duration of impetigo is usually several weeks. Subjective symptoms are, as a rule, absent, but occasionally there may be slight itching. All parts of the body may be invaded, but it occurs by preference on the face, hands, and lower extremities.

**Diagnosis.**—Impetigo may bear some resemblance to pustular eczema, impetigo contagiosa, and ecthyma. The pustules of impetigo are large, isolated, few in number, and do not incline to coalesce, while those of *eczema* are small, clustered, numerous, and tend to run together. The pustules in impetigo, further, are attended with but slight if any infiltration and itching, and have no inclination to break; in eczema infiltration is present, itching is marked and often constant, and the lesions rupture soon, with more or less crusting.

In *impetigo contagiosa* the primary lesions are vesicles, and the pustules when formed are frequently flat and umbilicated, with a tendency to coalesce. Impetigo is not contagious, and can not be traced to several of the same family, as in impetigo contagiosa.

In *ecthyma* the lesions are distinguished from those of impetigo by the pustules in the former being flat, and seated on a hard, inflammatory base, and surrounded by a marked areola. The crusts also differ materially, being in ecthyma brown or black in color, large, flat, and thick, and seated upon an excoriated surface.

**Pathology.**—The inflammation of the skin in impetigo is superficial, and is limited to the corium, involving only the papillary layer. Robinson states that it is a corpuscular inflammation, the embryonic, or pus, corpuscles being present in great numbers in comparison with the amount of serum.

**Etiology.**—Impetigo is a rare, non-contagious disease. It is encountered chiefly among children, particularly those that are improperly cared for and badly fed. It is also associated with disorders of the gastro-intestinal tract, and may occur after any debilitating affection. Its lesion depends upon the development of ordinary microbes of suppuration. Celoni reports a case of impetigo in a boy, followed by acute parenchymatous nephritis, which had a fatal termination.

**Treatment.**—Suitable hygienic measures, and good, nutritious food are of the utmost importance. If any special functional derangement exist, it should be corrected. It is often of advantage to put the patient upon tonic doses of quinine. The affected surface should be protected against irritation, and when the pustules are fully developed they should be incised and the pus evacuated. A mild mercurial, or other slightly stimulating ointment, may then be applied to the parts. Sozoiodol has been used advantageously as a dressing. If scabs have formed, they may be removed by water or oil dressings, or poulticing, after which the ointment can be applied to the surface.

**Prognosis.**—The prognosis is good.

IMPETIGO (or Dermatitis) HERPETIFORMIS.—This rare and serious affection was first described by Hebra, who observed but few cases, nearly all terminating fatally. It prevails, according to his experience, only among pregnant women. Kaposi, however, has met with one case in a man.

The eruption is characterized by the development of small, yellow pustules, arranged in groups or in the form of rings. The lesions incline to run together, and to dry into yellowish or brownish crusts, and at the same time similar pustules form around the periphery of the patch, pursuing the same course as in impetigo. The peculiar annular formation of the lesions present a resemblance to herpes iris. The surface beneath the crusts is red, moist, excoriated, and infiltrated. The disease attacks chiefly the anterior portion of the trunk and the inner surfaces of the thighs, but may occur upon the face, neck, arms, legs, and other parts of the body. In Hebra's patients there was marked constitutional disturbance, every outbreak of pustules being preceded by chills and fever.

Duhring describes the disease as consisting, in the majority of cases, of pustules and bullous lesions combined, or occurring alternately. The eruption in his cases was similarly arranged, and had a like course to those of Hebra's. The constitutional symptoms, he reports, were variable, but the itching was always violent. Duhring's patients were not pregnant women, and in no instance was there a fatal result. The eruption, he adds, manifested a disposition to recur, and was but little influenced by treatment. (See "Dermatitis Herpetiformis.")

Heitzmann reports the case of a woman at the climacteric period, with such an eruption, which was followed by a fatal termination. Robinson also records what he calls a well-marked case in a boy ten years of age, the lesions developed being papular, vesicular, pustular, and bullous, and occurring over all the body, except the palmar and plantar surfaces.

**Treatment.**—The disease is to be managed upon general principles, the symptoms being the guide.

## IMPETIGO CONTAGIOSA.

Impetigo contagiosa is an acute, inflammatory, contagious affection, characterized by the development of isolated, flat, or elevated vesicles, blebs, or vesico-pustules, the size of a split pea, or larger, which dry into slightly adherent crusts. It sometimes prevails in epidemic form. It attacks persons of all ages and classes, and is transmissible by inoculation. On this account it is extremely common in schools and institutions for children.

**Symptoms.**—The disease is generally ushered in with mild febrile symptoms. The eruption appears as small, isolated, flat or raised vesicles, or blebs, which soon increase in size, and become transformed into vesico-pustules, or pustules. They are usually round or oval, and occasionally umbilicated. They may, though rarely, be irregular in form. They may have a slight areola, or it may be wanting. The number of lesions is, as a rule, small, and at times, when closely seated, they may run together and form a patch. They may appear simultaneously, or in successive crops. In the course of a few days they dry into yellowish, straw-colored, and slightly adherent crusts, beneath which some slight excoriation exists, covered with a thin, purulent secretion. If the scalp is involved, the patches are circular, usually isolated, and covered with flat crusts, which mat the hair. The crusts, soon after their formation and drying, fall off, exposing an erythematous surface, which also in time disappears. Subjective symptoms are generally absent, but there may be at times slight itching. The affection, in the majority of instances, attacks the face, head, arms, and hands, but may likewise appear on other parts, even the mucous membrane of the eyes and mouth. The lymphatic glands in connection with the diseased surface may become enlarged and tender. Impetigo contagiosa may begin in one region, and, by scratching, spread by direct inoculation to other parts. The duration is from seven to ten days. Dr. Radcliffe Crocker has lately described a rare form characterized by gyrate lesions. Single lesions may equal an inch in diameter, but adjacent figures may coalesce and form patches of considerable size and gyrated outline. There is also a bullous form of impetigo, which resembles pemphigus. Jay F. Schamberg states that many cases of alleged pemphigus of the new born, and acute epidemic pemphigus, doubtless deserve to be described as examples of bullous impetigo.

**Diagnosis.**—Contagious impetigo may be confounded with impetigo, eczema pustulosum, and varicella. In impetigo the pustules are raised; in the contagious form they are, or become, flat. In eczema the lesions are not isolated, and the itching is often marked and constant, thus differing in these respects from impetigo contagiosa. Varicella is distinguished from impetigo contagiosa by the lesions remaining vesicular throughout the disease, as well as by their smallness in size and their general distribution over the body.

**Pathology.**—Vegetable organisms have been detected in the crusts. Tilbury Fox and others declare that they are merely accidental. No decided evidence has yet been adduced to account for the development of the lesions. Piffard considers contagious impetigo as connected in some manner with vaccination.

**Etiology.**—The disease is contagious and auto-inoculable. Leroux and Balzer, Griffin, Gilchrist and others have supplied evidence that the streptococcus pyrogenes is the cause of impetigo contagiosa. It occurs principally among the poorly nourished and unclean children, but it also appears among the higher classes of society, and at all ages. The barber shops are responsible for its spread among adults in all probability. On this account it is frequently mistaken for sycosis, or for a manifestation of ringworm. Impetigo is subject to changes, probably due to the infecting organism itself, though climate, humidity, temperature and personal conditions have an influence upon these manifestations. In some epidemics the lesions are bullous, in others pustular from the beginning. There is often also a tendency to heal in the centre and produce rings, like tinea.

**Treatment.**—The constitutional treatment should consist of fresh air, cleanliness, nutritious food, and tonics. Locally, the crusts should be first removed and the pus likewise carried off by irrigating the exposed surface with some antiseptic solution. This having been accomplished, zinc or lead ointments act beneficially. An ointment of five or ten grains of calomel or white precipitate to the ounce of lard has been found to be a useful application.

**Prognosis.**—The eruption disappears, often very rapidly, under suitable treatment.

## ECTHYMA.

Ecthyma is an inflammatory disease, characterized by the development of one or many isolated, flat pustules, situated upon an inflammatory base, and followed by cicatrization of the skin and temporary pigmentation.

**Symptoms.**—Ecthyma may occur as an acute or as a chronic affection. In the acute variety, which is rare, the eruption may be preceded by slight febrile symptoms, which usually disappear upon its appearance. Locally, there may be heat, burning, itching, and sometimes pain, followed by the formation of reddish raised spots, with hardened bases and a well-marked reddish areola, tender to the touch. These spots rapidly pustulate, and are in size about that of an ordinary pea, or larger. They are usually round in form, but sometimes are flat, sharply limited, and few or many in number. They give exit, in the course of a few days, to pus, which dries into thick, hard, yellowish to reddish or brown adherent scabs. The character of the scabs, however, will vary according to the quantity of blood which may be discharged with the pus. On their removal, the surface beneath may be excoriated or superficially ulcerated, and covered with a purulent, bloody, or sanious secretion. The disease runs its course in from one to three weeks, after which the scabs fall off, exposing slight spots of pigmentation or cicatrices. The pustules may, during the course of the disease, appear in successive crops or persist and pass into the chronic state.

Chronic ecthyma, which is more common than the acute variety, occurs mostly from some irritation of the skin, like that produced by animal parasites. The lesions are, however, similar in all respects to those of the acute variety. Ecthyma occurs at all ages and in both sexes, particularly in those who are badly nourished, unhealthy, and do not receive proper care. It usually attacks the extremities, but the back, buttocks, and other parts of the body may also be invaded.

The pustules of ecthyma have never been met with upon a mucous membrane. In feeble or unhealthy babes, ecthyma may assume a grave form, the lesions may become gangrenous and be converted into deep ulcers, involving the entire thickness of the skin and even the subcutaneous tissue. This variety is frequently accompanied by visceral disease, and usually has a fatal termination. Complications are occasionally encountered, such as lymphangitis, adenitis, subcutaneous abscess, or phlebitis.

**Diagnosis.**—Ecthyma is liable to be confounded with eczema pustulosum, impetigo, impetigo contagiosa, impetigo herpetiformis, and flat pustular syphiloderm. It may be distinguished from *eczema* by the pustules being discrete, as well as by their size and form. The character of the pustules and crusts, already described, serves to point out its difference from impetigo. It is known from *impetigo contagiosa* by the history or absence of contagion, the part affected, and the character of the lesions. Ecthyma may resemble *impetigo herpetiformis*, but the history, the grouping, and the peripheral spread of the lesions in the latter affection will assist in establishing the diagnosis. The affection may closely resemble the flat *pustular syphiloderm*; but the history of the latter, its slow course, the peculiarity of the pustules, crusts, and ulcers, with other evidences of syphilis, are sufficient to separate the one from the other.

| *Ecthyma.* | *Eczema Pustulosum.* |
|---|---|
| 1. Pustules sharply defined and discrete. | 1. Pustules grouped and coalesce. |
| 2. Pustules large, round, and few in number. | 2. Pustules small and numerous. |
| 3. Papules have a well-marked reddish areola. | 3. Papules present have no areola. |
| 4. Eruption preceded by fever. | 4. Eruption not preceded by fever. |
| 5. Occurs more frequently in adults. | 5. Occurs more frequently in children. |

| *Ecthyma.* | *Impetigo Contagiosa.* |
|---|---|
| 1. No history of contagion. | 1. History of contagion. |
| 2. Predilection for the legs. | 2. Predilection for the face and hands. |
| 3. Primarily papules, followed rapidly by pustulation. | 3. Primarily vesicular. |
| 4. Pustules are deep-seated, with an inflammatory areola. | 4. Pustules are superficial, with no areola. |

| *Ecthyma.* | *Pustular Syphiloderm.* |
|---|---|
| 1. No history of recent infection. | 1. History of recent infection. |
| 2. Course rapid. | 2. Course slow. |
| 3. Lesions single. | 3. Lesions polymorphous. |
| 4. Pustules inflammatory. | 4. Pustules not inflammatory. |
| 5. Incrustation yellowish in color. | 5. Incrustation purplish-green in color. |
| 6. Crusts solid. | 6. Crusts in concentric layers. |

**Pathology.**—In ecthyma, the inflammation, which is often very severe, is located in the upper layers of the corium. It leads to the development of pustules and destruction of tissue, followed by cicatrization and pigmentation, both of which in time may disappear.

**Etiology.**—General debility and a depraved state of the blood are the most frequent predisposing causes. These are mostly produced through bad or unsuitable food, improper hygienic surroundings, especially air. Uncleanliness, excesses, overwork, fatigue, and the effect on the system of acute or chronic diseases are also potent factors in producing the disease.

Among other predisposing causes are alcoholism, nephritis, diabetes, scrofula, and syphilis. Ecthyma sometimes occurs in the last week of typhoid fever or during convalescence. Eddowes and Hare reported[1] a case of severe ecthyma from which the diphtheria bacillus was isolated. The exciting causes are any influences which may irritate or inflame the skin, as scabies, pediculosis, and scratching. The workmen in sugar refineries are apt to suffer from ecthyma.

The virus of the disease may be conveyed by inoculation or auto-inoculation. The contents of a matured pustule deposited in the skin of another person or an animal may excite the development of a lesion, typical as regards its rate of progress and its production of a permanent scar. Upon the patient the lesions are spread by the act of scratching. These facts have been demonstrated by E. Vidal. The lesion begins to form a few hours after inoculation.

**Treatment.**—The first requirement is the removal of the cause of the disease. At the same time the patient should receive wholesome and nutritious food, together with the necessary exercise, bathing, and fresh air. The soap used for bathing should be neutral in reaction, or it may irritate the skin. Diet and hygienic measures will therefore be found to be the most certain means of restoring the system to its proper condition. The ordinary tonics are serviceable. Aperients, in addition, often prove of great value. Acute cases are frequently benefited by large doses of iron and quinine. The chlorate of potassium, given alone or in connection with strychnine or belladonna, lessens very much the tendency to the formation of the lesions. The phosphates, hypophosphites, the mineral acids, and codliver oil can be administered as they may be required. On account of their power in promoting nutrition, nux vomica and small doses (one-twentieth grain three times a day) of sulphate of copper have been found advantageous in appropriate cases. To invigorate and promote the digestion and stimulate peristalsis, the following combination will serve very well:

| | | |
|---|---|---|
| ℞ | Tincturæ nucis vomicæ .................. | fʒiij. |
| | Acidi hydrochlorici diluti ................ | f℥ss. |
| | Aloini ................................ | gr. iiss. |
| | Tincturæ gentianæ compositæ ......q. s. ad | f℥iij. |

M. Sig.: One teaspoonful in a little water after each meal.

Chronic cases may also be given the foregoing systemic treatment in addition to the hygienic measures. The local treatment will depend upon the cause and the stage of the eruption. If it is secondary to some other affection, as scabies or pediculosis, the exciting cause should as soon as possible be removed. In the early stage of the disease alkaline and emollient baths are always of service. Sulphur baths are likewise of benefit. Lotions which are of an anodyne nature may also be used; of these, lead-water and laudanum, or a weak solution of witch-hazel, will be found the most effective. Crusts should be removed with oil, or water-dressings or poultices, and cleansed with an antiseptic wash, as, for instance, a one-per-cent. solution of phenol, a two-per-cent. solution of chloral hydrate, or a solution (1:1,000) of corrosive sublimate. A weak mercurial ointment, ten grains (0.60 gm.) of calomel to the ounce (32 gm.) of lard, can then be applied. The red plaster of E. Vidal may be used for the same purpose, as recommended by M. Brocq.

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[1] The London Lancet, February 1, 1908, p. 282.

Red plaster is, however, an unsuitable application for aged people. In some cases powders may be preferred to ointments, and iodoform, iodol, thymol iodide, or salol may be dusted upon the surface of the sores. When the inflammation leads to sloughing, stimulating washes should be used. For the ulcerative form of the disease in children Brocq advises astringent lotions made from walnut leaves and containing a small quantity of chloral, or dry dressings consisting of powdered oakbark, coffee, quinine, rhatany, or sub-carbonate of iron. One drachm (4 gm.) of boric acid or sulphur, or a scruple (1.30 gm.) of naphthol to an ounce (32 gm.) of zinc ointment, is also recommended. I have found it advantageous to cleanse the lesions with a 1 to 2,000 solution of bichloride of mercury, after which I fill the ulcers with powdered red cinchona bark. If the sores obstinately resist treatment, a fifty-per-cent. solution of boro-glycerid, or a weak lotion of either phenol or nitrate of silver, will stimulate them to healthy action.

**Prognosis.**—The prognosis is good, except in old persons afflicted with other diseases, when it may be serious. It is often fatal in cachectic infants and in those suffering with diabetes.

## PITYRIASIS RUBRA.

**Synonym.—Dermatitis exfoliativa.**

Pityriasis rubra is an inflammatory disease affecting generally the entire surface, and characterized by a deep-red color of the skin, with abundant exfoliation of thin, whitish scales. The chronic form, exfoliative dermatitis, usually pursues an acute course, and is entirely distinct from the pityriasis rubra of Hebra.

**Symptoms.**—Pityriasis rubra, which is a rare affection, commences as small, red, scaly patches, which rapidly spread until the whole surface is involved. The skin presents a uniformly deep-red color, which is lessened by pressure. Whitish or grayish thin scales are [illegible] n-uously formed and cast off. The scales, w [illegible] epidermis, are generally abundant, and vary considerably in size. They may be large, even several inches in diameter, or small and branny. They are attached, as a rule, only at their centres, being free at their edges and slightly turned up; on their removal the skin beneath exhibits a shining appearance. In severe cases, the exfoliation is rapid and abundant, a large amount of scales often being cast off in the course of a day. The changes in the skin, as a rule, involve only the upper layers. The surface is dry, as there is no discharge. Thickening is generally absent, but in chronic cases may be present. Thinning or atrophy of the skin is especially marked on the hands and feet. There is a progressive general atrophy of the skin. Occasionally there may be edema of the extremities. In markedly severe cases, there may be contraction and great tension of the skin, the eyelids being ectropic, the mouth opened with difficulty, the fingers bent, the skin greatly affected on the elbow, knee, and soles, walking being interfered with. The nails may be attacked in severe cases, and may be opaque, softened, and at times fall out. The hair may also become thin and fall out, and the patient finally die of debility and exhaustion.

In the majority of cases of pityriasis rubra, itching and burning sensations are either not present at all, or exist but to a mild extent. The skin is tender, and the patient usually complains of being cold or chilly. Constitutional symptoms, if present, consist of more or less fever, elevation of temperature, and debility. The disease is generally quite chronic, and may persist for months or years. It occurs during adult life, and the cause of its development is involved in doubt. It may be due to some form of systemic disease. The acute form has an entirely different clinical course.

A very remarkable case of *skin shedding* has been described[1] by Dr. J. Frank. The exfoliation, which was complete, had recurred, for thirty-three consecutive years, on the same day of the month and within a few hours of the same time of the day. The patient was a man, thirty-four years of age, a miner by occupation, strong and, in other respects, perfectly healthy. He had never suffered from any of the eruptive fevers. The first attack occurred when he was six months old. He was suddenly taken ill, vomited, was feverish for three or four hours, when the symptoms subsided. On the fourth or fifth day afterward the entire cuticle was cast off, and a few days later the nails were also shed. A paroxysm always began abruptly with a feeling of lassitude, which lasted fifteen or twenty minutes, and was followed by muscular tremors, nausea, and vomiting. The temperature rose rapidly, the skin and mucous membrane of the tongue and mouth became red and inflamed. Perspiration was suppressed until the attack was at an end. Acute symptoms began to ameliorate at the end of three or four hours, and disappeared by the twelfth hour, the skin remaining red for thirty-six hours longer. At times delirium occurred during an attack. In early life the cuticle began to be shed on the third day after appearance of the symptoms, and the process was completed by the fifth day. The time, however, lengthened with each succeeding year until ten or twelve days were required. The epidermis could be detached in large sheets, and from his hands and feet the patient removed it intact in the form of gloves or moccasins. The nails loosened and fell off in about four weeks after the acute stage. When the eruption was at its height the appearance resembled that of scarlet fever, and a touch caused a sensation like that of an electric shock. Microscopical examination of a section of the skin gave negative results. Similar cases have been reported by Ferriol and Besnier. but lacked the feature of periodical recurrence.

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[1] Western Medical Reporter, February, 1891.

L. D. Bulkley[1] reported a case which had been mistaken for scarlet fever. Desquamation occurred in a young girl, at intervals, without previous fever, or apparent illness. It affected the hands principally, and seemed to be hereditary, as her father also was subject to similar attacks.

It sometimes occurs *epidemically* in certain institutions and infirmaries. Vomiting and anorexia, sore throat and diarrhea may be present. The eruption occurs in blotches and spreads over the body, with considerable rapidity, presenting a deep-red inflammation covered with many flaky scales. In some cases vesicles have appeared which break and discharge and give the appearance of acute eczema. It runs its course in six to eight weeks. In almshouses there is considerable mortality from the disease, sometimes as high as thirteen per cent.

At the International Congress of Dermatology and Syphilography, August, 1889, in the course of an exhaustive review of the varieties which have been classified as pityriasis rubra or primitive exfoliative dermatitis, M. Brocq asserted his belief that a great number of different affections are characterized objectively by a generalized redness of the derma, and a more or less abundant desquamation of the epiderm. The group is not homogeneous. Excluding the pityriasis rubra pilaris of Devergie, the pernicious lyphodermia of Kaposi, generalized red and desquamative eruptions of artificial origin, and those which may occur in the course of an eczema, psoriasis, or lichen planus, there remains a class known as essential. To these the generic title should be confined. They are: (*a*) desquamative scarlatiniform erythema, or acute benign exfoliative dermatitis; (*b*) generalized exfoliative dermatitis, properly so-called, or subacute; (*c*) chronic dermatitis; (*d*) chronic pityriasis rubra, type Hebra; (*e*) subacute or benign pityriasis rubra.[2]

**Diagnosis.**—Pityriasis rubra may be confounded with eczema squamosum, psoriasis, pemphigus foliaceus, and lichen ruber. From *eczema* it is to be distinguished by the absence of marked thickening, the formation and character of the scales, and also the absence usually of subjective symptoms.

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[1] Therapeutic Gazette, Oct. 15, 1907.

[2] Le Progrès Médical, August 10, 1889; Medical Bulletin, March, 1890

From *psoriasis* it differs generally in involving all surfaces. In psoriasis the scales are also different, being thicker, and seated upon infiltrated bases.

*Pityriasis rubra* may be mistaken for *pemphigus foliaceus* from the distribution and character of the exfoliation, but the formation of bullæ in the latter serves to distinguish the two diseases. *Lichen ruber planus* may be diagnosed from pityriasis rubra by always exhibiting papular lesions, and having some thickening of the skin; conditions which are not present in the disease under consideration. *Scarlatina* is differentiated by the fever, sore throat and other acute symptoms; which do not occur in exfoliative dermatitis.

**Pathology.**—The disease is an epidermal catarrh, which gradually extends over the body. Hebra has shown, in mild cases, cell-infiltration of the rete and corium, the papillæ, glands, and hairs presenting a normal appearance. In severe attacks, he observed marked chronic inflammatory infiltration. The cell-infiltration was abundant in all layers of the skin, and particularly beneath the epidermis, where there was a thin layer of compressed rete-cells largely filled with infiltration-cells. A thick, flat, connective layer existed beneath, and, still below, a layer of thick, elastic tissue, thrice the thickness of the three layers already mentioned, and having also a collection of yellow granular pigment. The papillæ were absent, and the blood-vessels in the sub-epidermal tissue were surrounded with rete cell-infiltration. The sebaceous and sweat glands were also absent, with, however, occasionally one of the former present. The hairs were scanty and the hair-sheaths infiltrated with cells. In cases of long duration, atrophic changes occur in the skin, and this organ becomes somewhat contracted so as to cause ectropion of the eye-lids and eversion of the lips. Fissures also occur about the mouth and anus.

**Etiology.**—Nothing is positively known concerning the origin of essential exfoliative dermatitis. It has occurred in connection with tuberculosis, albuminuria, and glycosuria, while in other cases its subjects appeared in perfect health until attacked. Tilbury Fox held that it was due to nervous disturbance.

**Treatment.**—The results of treatment are unsatisfactory. Constitutional treatment will vary according to the condition of the patient; as a rule, sustaining measures act most beneficially. Iron, quinine, codliver oil, linseed oil, and arsenic are remedies which may be resorted to with advantage. The use of phenol is reported to have been followed by good results. Aperients and diuretics may sometimes be indicated. In a case, which had resisted the action of various local and constitutional remedies, Dr. Walter Scatchard obtained a good result from the use of thyroid tablets. Improvement began at the end of the twelfth day and gradually continued until, in the course of three months, the skin was almost normal. Dr. Stephen Mackenzie advises daily hypodermic injections of pilocarpine, and a lotion composed of one ounce (32 gm.) each of glycerole of lead and glycerin to a pint (512 gm.) of water. Bandages saturated in this mixture should cover the patient from head to foot, a mask being used for the face and scalp. The patient, thus enveloped, should lie between blankets on a spring or water mattress. The strength of the lotion may in some cases be increased, though if too strong it gives rise to burning and irritation. After the scales have been removed some simple ointment is rubbed over the entire body. Weak alkaline and emollient baths are occasionally productive of good effect. The constant protection of the surface, by the application of a bland fat or oil, is serviceable. Olive, linseed, and codliver oils are the most effective remedies for this purpose. In cases attended by itching some phenol or menthol may be incorporated in any of the oils just named.

**Prognosis.**—The prognosis is not, as a rule, favorable. The general and severe forms are usually fatal. The typical cases of pityriasis rubra of Hebra are almost invariably fatal.

PITYRIASIS ROSEA.—Gibert first described and named this affection. Duhring, Weyl, and others have given a detailed account of it under the same name. Bazin, Hardy, and Horan have spoken of it as "pityriasis maculata et circinata," which is a better title than pityriasis rosea, but the latter is in general use. The disease is rare, may or may not commence with fever, though it is seldom absent, and generally accompanied by severe headache. The fever is followed by the appearance of macular or maculo-papular patches, principally upon the trunk. The limbs and face are sometimes invaded, and in rare instances the disease begins upon and is confined to the upper extremities.

The lesions may or may not be slightly elevated, or they may be depressed. In size the patches vary from a pin's-head to a split pea, or larger, and they are either isolated or confluent. They are round or oval, mostly light or dark-red, which gradually becomes yellow. The patches are dry and scaly, with a tendency to spread in the periphery and heal in the centre. The primary lesion is surrounded by a zone of erythema. Neighboring patches may coalesce and form pictures of varying contour, as semicircles, circles, or discs. Subjective symptoms may be wanting, or may be present in the form of more or less itching. According to Barduzzi, itching or a sensation of heat, burning, or pricking usually occurs intermittently, especially where two folds of skin are in contact. The tactile sense appears to be somewhat lessened in the centre of the patches. The lesions appear gradually or suddenly, the patches coalescing and then spreading until a large surface is involved. The eruption generally remains from four to eight weeks, and spontaneous recovery fol The affection occurs chiefly in adults of both sexes in good health. We possess no definite knowledge as regards the cause of this affection. Pityriasis rosea does not seem to be contagious, though an epidemic was observed by Peroni. Pityriasis rosea may resemble ringworm, but the absence of the peculiar fungus of the latter will at once settle the diagnosis. Besnier points out that seborrheic eczema may bear, when seated upon the trunk or limbs, a very close resemblance to pityriasis rosea. In these cases the presence of seborrhea, seborrheic scales, or eczema upon the scalp is of diagnostic import.

**Treatment.**—Weyl believes that active treatment is contra-indicated. Baths, mild dusting-powders, and soothing ointments may, he thinks, assist in a more rapid recovery. Barduzzi advises plain diet, alkaline diuretics, and, it may be, a saline cathartic.

DERMATITIS EXFOLIATIVA NEONATORUM (*Keratolysis Neonatorum*)—This condition, also described as Ritter's disease[1] was first recognized as a distinct disease by Ritter in the Foundling Asylum, at Prague. It occurs during the first month of life, as a rule, and is usually attended by marasmus and sometimes by diarrhea. It appears to be septic in its origin. The lesions appear usually upon the lower part of the face, but may develop elsewhere first, in patches of red, scaly character, which rapidly spread and coalesce so as to become universal. It is soon attended by a fine branny desquamation, or large scales. There may be some vesicles and bullæ, and in these cases scales or crusts are found. There are also infiltrations around the muco-cutaneous openings, with fissures of the mouth and anus. There is no marked fever, but the loss of strength is evident, and in a large proportion of cases, death occurs from exhaustion and marasmus. Secondary infection may produce boils or abscesses, or even gangrene. The disease may end in recovery in a week or ten days, but relapses may occur.

A lanoline cold cream, containing a small proportion of boric acid, or oil of cade, will be of service. The free use of borated talcum powder is also advantageous. Special attention should be paid to the condition of the digestive organs, the diet, and hygienic conditions.

## FURUNCULUS.

SYNONYMS.—Furuncle—Boils—Fr. Clou—G. Schwären Blutschwären.

Furunculus is a circumscribed inflammation of the true skin and subcutaneous tissue, developing one or more various-sized, hard, and painful tumors, which terminate in suppuration and the formation of a central necrosed mass or core.

**Symptoms.**—The affection may be ushered in by slight or severe constitutional symptoms, or they may be entirely absent. Locally, the first evidence of the disease is an itching, burning, or painful sensation in the skin, followed by the appearance of a slightly reddened, elevated spot, which is tender, often painful, hard, and deep seated. Gradually it increases in size, and manifests a tendency to suppurate. In the course of a few days, usually from three to six, or more, according to the region involved, it reaches maturity. When fully formed the lesion appears as a round or conical tumor, with a collection of pus in the apex. The tumor is usually around the opening of a follicle, or is pierced by a hair. In some cases there may be no formation of pus, when the tumor is known as a blind boil. In size it may vary from a split pea to a pigeon's egg. In color it is usually of a deep or bright red to a purple. The pain which is generally present is of a throbbing or burning character, being more intense at night, and increasing in severity until the lesion is opened or bursts, when it ceases. Furuncles rarely appear singly, but are generally multiple. They may occur in successive crops, several appearing as others are disappearing. As a rule, they are isolated. They may invade any region of the body, but attack by preference the face, neck, axillæ, back, breast, buttocks, the anal and genital regions, and the extremities. Boils at times develop as a complication with eczema, scabies, and other diseases of the skin.

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[1] Journal of the American Medical Association, Nov. 16, 1907, p. 1607.

**Diagnosis.**—The diagnosis of furuncle is always easy, and, after considering the symptoms, errors are almost impossible. The affection differs from ecthyma in being deeper and having a central core. In like manner it can be separated from pustular syphilis by the absence, in the latter, of a central core, and in the history of the disease, with the presence of specific lesions upon other portions of the body. From carbuncle it differs in being smaller, with but a single point of suppuration, and being usually multiple. Carbuncle is larger, with two or more points of suppuration, and occurs singly.

**Pathology.**—The furuncle arises, no doubt, from some derangement in the circulation which is favorable to a local infection, especially with the staphylococcus pyogenes aureus. This gives rise to acute inflammation and exudation, leading to necrosis of the tissue. The attempt by suppuration to throw off this dead tissue constitutes the peculiar process of the disease. An embolus forms in the capillaries around the sebaceous or sudoriparous glands, developing mortification of the gland, with consequent circumscribed inflammation and plastic infiltration. The plastic infiltration is followed by a purulent one, which is discharged with the central mass or core. On the separation of the core there remains a cavity, with surrounding infiltrated tissue, which gradually closes by granulation.

**Etiology.**—A distinct predisposing cause to boils exists in some internal derangement. Nervous impairment, chlorosis, diabetes, albuminuria, rheumatism, gout, tuberculosis, scrofula, dyspepsia, fevers, and debility are among some of the more active causes which lead to their development. They also occur from many functional derangements of the system, from changes in the habits and modes of living, diet, seasons, and as the result of poisons, debilitating diseases, and from great fatigue. The blood very often, from one or another of the above conditions, has effete products circulating in it, and only requires some local irritation of the skin as a cause; *e.g.,* chafing of the skin by the saddle when riding, or of the neck by a starched collar, the wearing of dyed clothing, bathing, scratching, blisters, contact with pus, poisons, ointments, and other substances. Hergott records an epidemic of boils in the lying-in hospital at Nancy, which was apparently caused by an infected bed-pan. Boils occur at all periods of life, but are more frequently seen in young and old people. Some individuals are much more liable to them than others.

Dr. Schimmelbusch, of Cologne, has made many examinations of pus taken from boils, and has invariably found it to contain the staphylococcus pyogenes aureus, and albus, the first-named variety being particularly numerous. A pure culture of this organism gave rise to boils when rubbed into the skin. Microscopic examination of a piece of this skin showed that it was intact and that the germs had entered the hair follicles thence penetrating the adjacent tissue. Loewenberg, of Paris, concurs in this opinion.

**Treatment.**—This affection demands both constitutional and local treatment. Hygienic measures, such as frequent ablutions, with exercise, and possibly a change of air, often prove of service. In cases suffering with a "crop of boils" or an attack of furunculosis, the diet should be very nutritious, and administered as a medicine, if the patient, as is often the case, has lost all desire for food. It is well also to forbid the use of coffee, pork, salted meat, cheese, fish, and shell-fish.

The cause should be sought, and appropriate remedies given according to the indications. If the secretions are disordered, they should at once be corrected. In broken-down and debilitated subjects, iron, quinine, strychnine, the mineral acids, codliver oil, and arsenic are the most suitable to employ; the selection to be made as the case may require of one or another of these agents. Small doses of opium are advisable when the pain and discomfort are very great. The moderate use of malt and spirituous liquors in the weak and aged is advisable.

Bouchard has known furuncular eruptions to be arrested in their progress by disinfection of the alimentary canal, and Le Gendre has obtained excellent results by this mode of treatment, administering 30 cgm. (four and a half grains) each of betanaphthol, salicylate of bismuth, and magnesia every four hours, making use of local antiseptic washes at the same time. In cases dependent upon gout, Brocq claims to have obtained good results from prolonged use of the extract of colchicum in the daily dose of three to four centigrammes (one-half to two-thirds of a grain). Tonics, especially the simple bitters, with the alkalies, are useful. Young, plethoric, and vigorous individuals in whom there is a deficient elimination often improve rapidly upon alkalies, diuretics, and aperients.

The most active remedies as prophylactics, and in overcoming the tendency to suppuration, after the boils develop, are the chlorate of potassium, the syrups of the phosphates, the hypophosphites, the syrup of hydriodic acid, and the sulphide of calcium, used alone or in conjunction with various other tonics and aperients. If there is a tendency to the development of boils, or even when they are established, I invariably give five or ten grains (0.30 or 0.60 gm.) of the chlorate of potassium, three or four times daily, in water, or as in the following formula:

| | | |
|---|---|---|
| ℞ Potassii chloratis .................. | gr. c. | 6.50 |
| Aloini .......................... | gr. ij. | 0.12 |
| Syr. phosphatis co................ | f℥v. | 160. |

M. Sig.: Two teaspoonfuls three or four times daily.

Potassium chlorate may be well combined, in cases needing it, with the syrup of the lactate or iodide of iron. Another excellent remedy is the syrup of hydriodic acid, twenty to thirty drops, three or four times daily. It may be given in combination with the compound syrup of the hypoposphites of the National Formulary. Sodium hyposulphite has been used for the same purpose, as well as a mixture containing equal parts of sodium and potassium sulphide, sodium sulphate and bicarbonate, tartaric acid, and gum arabic. Of this mixture seven and a half grains (0.5 gm.) are administered several times a day in half a glassful of water. Yeast has been thought to have an influence in preventing the formation of boils. A combined internal and external employment of boric acid is recommended by Dr. Alison for the purpose of aborting boils, curing those which have already developed, and for preventing new eruptions. He administers twelve grains (0.72 gm.) daily for several days, and applies a hot four-per-cent. solution of boric acid, rubbed upon the surface, followed by hot compresses moistened in the same solution. Local treatment is also valuable, but not so effective, in relieving or eradicating the disease. The boils may sometimes be aborted by applying compression in the form of a bandage or one of the medicated plasters, the soap-plaster being considered most useful for this purpose. They may also at times be aborted by applying to their apices one of the caustics, as the stick nitrate of silver. The same object may be accomplished by an ointment of silver oleate, the salt being first dissolved in an equal quantity of oleic acid and then mixed with lard in the proportion of five to sixty grains (0.30 to 4 gm.) to the ounce (32 gm.). It is claimed that one application of liquid air is sufficient to abort a boil.[1]

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[1] Ormand Barnesby: The Medical Mirror, Nov., 1903.

Professor Verneuil, of Paris, states that a boil may often be prevented by spraying the surface with a two-per-cent. solution of phenol or boric acid. If suppuration has already taken place, the spray will materially assist the effect of the incision and hasten recovery. Darier uses a spray of resorcinol in ether (5 per cent.). If this fails, he uses ignipuncture. The body and clothing of the patient should be protected by towels and the immediate vicinity of the furuncle by diachylon plaster. Others seek to accomplish the same purpose by the injection of a few drops of a two-per-cent. solution of phenol into the base of the swelling. The external application of an alcoholic solution of phenol, the use of the electro-cautery, camphorated alcohol, or tincture of iodine have also been recommended. In order to prevent recurrence it is well to make use of a lotion consisting of equal parts of the tincture of iodine, tincture of arnica, and spirits of camphor, as advised by Brocq.

The following combination has been used by Kunton:

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|---|---|---|---|
| ℞ | Phenol liq. | gr. viij. | 0.50 |
| | Fldext. ergotæ | ʒj. | 4. |
| | Amyli, | | |
| | Zinci oxidi | āā ʒij. | 8. |
| | Cerati | ℥j. | 30. |

M. Ft. ungt. Sig.: Apply twice daily on soft linen or patent lint.

Dr. Jamieson gives the following formula for a preparation that may be used in the hope of aborting a boil:

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|---|---|---|---|
| ℞ | Tr. arnicæ | fʒj. | 4. |
| | Acid. tannic | ʒss. | 2. |
| | Pulv. acaciæ | ʒss. | 2. M. |

This mixture is painted upon and a little beyond the inflamed surface, each layer being allowed to dry before another is applied. The process is continued until a tolerably thick coating covers the part.[1] Sir Peter Eade claims that the development of a furuncle may be checked by frequently soaking the swelling, in its formative stage, with a solution of salicylic acid. Jorissen's method of accomplishing the same purpose is by one or more frictions daily with an ointment composed of five grains (0.30 gm.) of red oxide of mercury to an ounce (32 gm.) of lanolin, each friction lasting for three or four minutes. Spohn warmly recommends[2] the topical application of a solution of chloral—two and a half drachms (10 gm.) to ten fluid drachms (40 gm.) each of glycerin and water. Vikentive claims to be able to absolutely abort the formation of a boil by thoroughly scrubbing the lesion with soap and water, then washing off by fifty per cent. of alcohol, then a compress soaked in alcohol allowed to remain on the part until all the alcohol has evaporated. The lesion is again washed with soap and water, and the suds allowed to dry on; no other dressing is applied. If there is no pus a single treatment will suffice to abort the furunculous outbreak. Gallois has had good results from an iodine solution made with acetone (2 per cent.). A drop of this solution is placed upon the top of the boil. He does not incise the boil, but if the skin is broken he applies a compress moistened with glycerin and water (1-10). This dressing is to be renewed once daily.

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[1] Jamieson, *op. cit.*, p. 193.

[2] Archives Med. Belges, July, 1891.

In the treatment of furuncles of the external auditory canal, Dr. Cholewa has derived much advantage from the use of a twenty-per-cent. solution of menthol in oil, which reduces swelling, relieves pain, and at the same time exerts a specific bactericidal action. A twisted pledget of cotton moistened in this solution is introduced within the meatus. The plug should be large enough to exert a gentle pressure and be renewed daily. A slight burning sensation is at first produced by the application, but soon disappears. If suppuration has occurred, the boil should be opened and the tampon reapplied.[1] In the same condition Loewenberg advises a supersaturated solution of boric acid in alcohol. A weak solution he declares to be useless. A good application in the same condition is a twenty-five-per-cent. solution of aluminium acetate, dropped frequently into the ear and the canal plugged with cotton.

A solution of pyoktanin, one part to five hundred or even one hundred, is a good application to the surface of a boil. An ointment of belladonna, or of mercury, or a mixture of equal parts of these preparations, is sometimes successful in aborting the progress of a boil. Iodol ointment, ten grains (0.60 gm.) or more to the ounce (32 gm.) of lard, is useful on account of its antiseptic properties. Ergotin made into a paste with water has been suggested as an application in the formative stage. A paste of powdered opium and water likewise affords relief at the same period. An ointment of the oleate of iron may be used with success. After the boil has been formed, and in its early stage, cold applications—viz., ice, ice-water, lead-water, and laudanum, diluted tincture of witch-hazel, and the tincture of arnica—are beneficial to relieve the tension and inflammation present, and lessen the pain. Veiel recommends a paste composed of oxide of zinc and vaseline with four per cent. of boric acid. When suppuration has set in, warm and hot applications are serviceable, and assist in hastening the expulsion of the inclosed dead mass. The judicious use of poultices at this period is advisable, but care must be taken not to use them too early or too continuously, as they may increase the irritation and excite the formation of a new crop. It may become necessary, owing to the severe inflammatory action that may be present in and around the affected integument, to apply soothing and sedative ointments, especially those containing opium, lead, arnica, etc. The application of compound resin cerate, or what is popularly known as Deshler's salve, by its stimulating action hastens suppuration decidedly. When suppuration is established, a free incision will lessen the inflammation, hasten the expulsion of the broken-down tissue, and assist in restoring the parts to their normal condition. Early incision, on the other hand, is not advisable at all times, as it often lessens, but will not remove, the tendency to suppuration. The use of a dilute solution of hydrogen peroxide once a day, applied with a glass syringe, hastens the healing process. Granulation is favored by dressings moistened with artificial gastric juice.

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[1] Therapeutische Monatsheft, June, 1889.

**Prognosis.**—The prognosis is generally good. The lesions may appear successively, and be prolonged for months, but the eventual result is favorable.

## CARBUNCULUS.

SYNONYMS.—Anthrax—Brandschweren—Carbuncle.

A carbuncle is a circumscribed, painful inflammation of the skin and subcutaneous cellular tissue, sometimes involving the deeper structures, and terminating in gangrene of the affected part. Ordinary carbuncle should not be confounded with malignant pustule or anthrax maligno.

**Symptoms.**—The development of a carbuncle is generally preceded by either slight or severe constitutional symptoms. After more or less *malaise;* there may be headache, chill, and fever, or even more decided systemic disturbance. The skin of the affected part then becomes hot, hard, swollen, painful, and bright- or dark-red in color. The pain, which is often very severe, is of a dull, burning, or throbbing character. Sooner or later, the swelling assumes a brawny appearance, followed by softening of the tissue; the overlying skin becomes thin; vesicles or pustules may form, which rupture; or many openings occur, through which sanious pus oozes. The openings are centres of suppuration, which are blocked up with necrotic masses or cores, giving the part a cribriform appearance. The necrotic tissue, or cores, may come away after a time in portions, or slough out entire, the morbid action in severe cases destroying thus not only the superficial, but all the deep, soft structures of the part involved. There remains after the removal of this mass a cavity, or deep ulcer, with undermined edges and uneven base, which is filled up slowly by granulation, forming usually a pigmented, and often lasting, cicatrix.

A period of incubation of two or three days is usually observed after exposure or inoculation. Carbuncles generally occur singly, but may be associated with or surrounded by boils. They are variable as to size, being usually from that of an ordinary hen's egg to a saucer, or larger. They occupy as their selective seat the back of the neck, the back, and buttocks. The course and duration of the disease will vary according to the age of the patient, the condition of the system, its power of resistance, the region invaded, and the size of the carbuncle. In broken-down and elderly people it is a serious and at times a fatal disease.

**Diagnosis.**—Carbuncle differs from *furuncle,* about the only disease with which it might be confounded, in being mostly solitary, larger, and containing many points of suppuration. In its early stages it might also resemble *erysipelas,* but the circumscribed character of the inflammation, together with its hardness and painfulness, should always serve to distinguish it. From *malignant pustule* it is distinguished by absence of history of a bite by a fly, or handling skins, or hair of animals which had died of anthrax. At the site of inoculation a vesicle forms, containing a blackish serum filled with micro-organisms of virulent character, especially the anthrax bacillus. A considerable eschar is formed. The constitutional symptoms are much more severe than in ordinary carbuncle, and there is a great amount of local edema in the vicinity of the lesion.

**Pathology.**—The pathology of ordinary carbuncle is similar to that of furuncle. The inflammation, however, is more extensive, beginning in many points, and extending downward to the deeper structures, as well as horizontally, and terminating in gangrene of the entire part involved. The fat columns described by J. Collins Warren become channels for the spread of infection and the discharge of pus.

**Etiology.**—The causes of carbuncle are similar to those of furuncle. It cannot always be traced to any assignable cause. It frequently attacks those who are broken-down in health. Diabetes, albuminuria, rheumatism, and gout are among some of the prominent causes which occasion it. It occurs more frequently in summer than in winter. Men are more prone to the disease than women, and it is more frequently observed in middle and old age. W. A. Hardaway, of St. Louis, has seen cases of carbuncle, and of furuncle, which had been acquired in barber-shops from infected shears, or unclean hands.

**Treatment.**—The treatment required is both constitutional and local. The systemic depression is more severe and serious, and therefore must be met more promptly and actively than in boils. Hygienic measures, and especially good nursing, are essential. The diet should be nutritious, consisting largely of animal food, as beef-tea, milk, and mutton-broth. Stimulants should be resorted to, and often employed for decided effect, particularly if there is much attendant depression and exhaustion. Whisky, champagne, and the preparations of ammonia are the most appropriate agents to administer in the above condition, as assisting to support the flagging powers of the body. The most effective remedies to employ are the tincture of the chloride of iron and quinine. If the case is simply an ordinary carbuncle, the patient may do well on moderate [illegible] these drugs, but if the constitutional symptoms are mark [illegible] in large and often-repeated doses. Thus, in sev

I generally prescribe one-drachm (4 gm.) doses of the tincture of the chloride of iron every two or three hours, with ten or fifteen grains (0.60 to 1 gm.) of quinine three times daily. Opium, or some other anodyne, is often necessary to overcome or lessen the pain and afford rest to the patient. The internal administration of potassium chlorate is beneficial and diminishes suppuration. The local treatment is frequently most beneficial in relieving the throbbing pain and expelling the offending mass. In the early stages cold applications, especially of ice, may give much relief. Excellent results are obtainable by excision and application of a solution of corrosive sublimate (1-1,000) followed by alcohol compresses. Where the patient's general condition will not permit excision, local anesthesia may be produced by ethyl chloride spray, and a cross cut made through the carbuncle. Daily exposures from 2 to 3 minutes to the Röntgen rays, at a distance of 20 centimeters, greatly aids recovery. The only dressing required is 3 per cent. hydrogen dioxide on gauze, as recommended by C. Evler.[1] Applications of liquid air, by spray, to the interior of the cavity of the carbuncle have been recommended by Dr. A. Campbell White, of New York. Boils may require one application, carbuncles, one to three. The slough discharges in a mass, leaving a clean surface which soon granulates.

Dr. A. E. Spohn has witnessed excellent results from the application of a ten-per-cent. solution of chloral hydrate in glycerin and water, sulphide of calcium being given internally at the same time. By this method he claimed that in some cases the necessity of incision was avoided. Painting with phenol, or cantharidal collodion, is also recommended. Hypodermic injections of a five- or a ten-per-cent. solution of phenol have been known to be effective. (Camphor and phenol with petrolatum oil, or glycerin, is an excellent combination, and has the advantage of being free from disagreeable odor.) An ointment of iodol, ten grains (0.60 gm.) or more to the ounce (32 gm.), is a good antiseptic application and promotes cicatrization after ulceration has occurred. An ointment of silver oleate, if applied early, may prevent the formation of pus. The diluted fluid extract of hamamelis is a serviceable lotion. Puncturing deeply with a long, thin knife will lessen the tension and relieve the pain. Piercing the carbuncle in a number of places with a stick of caustic potash, or allowing small pieces of the potash to become inserted in it, and permitting them to remain, as originally recommended by Physick, is very painful, but assists in separating the diseased mass. A strong solution of phenol, in water or glycerin, injected into the cribriform openings is warmly recommended by Sir Peter Eade.[2] M. Beauquinque advises the application to the openings of tincture of iodine, by means of a brush or pledget of cotton, or by injections into the interior. A solution of pyoktanin may also be used as an antiseptic application. Dr. McRiddie reports success from the use of equal parts of iodoform and oxide of zinc. The surface is first cleansed with a solution of phenol or corrosive sublimate, then covered with the powder and lint soaked in phenolized oil. He makes no incisions, but removes sloughs with the forceps. Polaillon makes use of sticks of Canquoin's paste in a manner similar to that in which caustic potash is employed. The preparation consists of one part of chloride of zinc, two of wheat flour, and enough water to form a paste, which can be moulded into the form of rods. Dr. Riedel advocates complete extirpation of the carbuncle by means of a circular incision, from which a number of radial incisions are made to the surrounding healthy parts. The infiltrated tissue is dissected out, the flaps approximated on the following day, with an opening in the centre providing for drainage. The temperature, it is said, falls to normal on the evening of the day of operation, the loss of tissue is reduced to a minimum, healing advances rapidly, and a good cicatrix is the result.

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[1] Medicinische Klinik, Berlin, Dec. 3, 1905.

[2] British Medical Journal, May 19, 1888.

As soon as suppuration has set in hot applications, especially the use of poultices, are advisable. The moment pus is formed a free incision or incisions—the crucial being the best—should be made, the dead tissue scraped or dug out, and the parts kept clean by antiseptic dressings. The resulting ulcer may be dressed with phenolized oil or an ointment containing balsam of Peru. Or, the surface having been washed with a weak solution of corrosive sublimate, iodoform may be employed. Applying bicarbonate of sodium over the surface of a carbuncle and allowing the dry dressing to remain a day or two is a very efficient treatment. The Bier method of producing local hyperemia is recommended by Erwin Reissman, of Newark, N. J. He opposes injections, poultices and free incision. His plan is to make a small incision after freezing the part with ethyl chloride and then applies a cupping glass just large enough to cover and extend a little beyond the external margin of the swelling. The cup is left in place for 10 or 20 minutes each sitting. On removal of the cup, a plain wet dressing is applied. This is repeated for four or five days, and nearly always at this period effects a cure, free from discomfort and pain. A cupping glass may be improvised by using a small drinking glass, and a piece of lighted cotton.

Waterhouse reports[1] a patient who had had eleven carbuncles in three years, all of which had required incision and removal of the slough. He consulted me with the twelfth. It was still in an early stage, and as a last resort I advised treatment by Bier's suction glass. I have learned from him that during the past twenty-two months he has had five carbuncles, four of which disappeared under suction treatment, the remaining one suppurating but healing under suction treatment far more rapidly than had been the case in any carbuncle in his extensive personal experience.

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[1] An address on Professor Bier's "Treatment by Means of Induced Hyperæmia," delivered to the South Midland Branch of the British Medical Association at its annual meeting, by Herbert F. Waterhouse, M.D., C.M.Edin., F.R.C.S. Eng.; The British Medical Journal, July, 18, 1908, p. 125.

Dr. J. T. McShane, in the "Medical Mirror," advises the use of the rhigolene spray before opening a carbuncle. Not only is the operation rendered painless, but he believes that the sloughing is thereby accelerated and consequently the cure hastened. The part should be deeply frozen by allowing the spray to act upon the surface for about two minutes.

**Prognosis.**—The prognosis should always be cautiously given. It will depend to a great extent upon the age, condition of the patient, amount of disease, and the existence of complications. It is serious after middle life, especially if the carbuncle is large, the subject in poor health, and if disease of the kidneys or other organs be present. A fatal termination at times follows, particularly under the above conditions, but not so frequently as is generally supposed.

ANTHRAX MALIGNA.—Malignant pustule is a rare disease, produced by the *bacillus anthracis,* usually communicated from the lower animals. It may be contracted through partaking of milk, butter, or meat from diseased animals, but oftener through the agency of flies or insects. Tincolini witnessed an epidemic which caused the death of four persons and infected twenty-six others. The outbreak, in all probability, originated from a diseased calf which was killed and sold for food. Goldschmidt describes a case which occurred in the person of a brushmaker and in which infection seemed to be due to the bristles used by the man in his work. After death extravasations were found in the cervical glands, bloody transudations in the serous cavities and ecchymoses upon the mucous membrane of the stomach and small intestines.[1] A similar occurrence has been reported from Lille, where five work-people in a brushmaker's employ were fatally contaminated by handling bristles imported from Persia. Commonly it is contracted by handling diseased dead animals, or their hides, and it is even said to be brought about by inhaling dust containing the virus. Butchers, tanners, furriers, and wool-sorters are most liable to it. Intestinal lesions may be provoked by the consumption of raw or insufficiently cooked food, and pulmonary anthrax is seen especially among wool-sorters as a consequence of inhaling an infected atmosphere. A few hours after inoculation a burning, itching, or painful sensation sets in on the affected surface. This is followed by the development of a papule, vesicle, or pustule; the latter lesions extend until they become as large as a coin, and rupture, exposing gangrenous tissue, or an unhealthy ulcer. In the great majority of cases the lesion is single, but exceptionally two or three may coexist. The surrounding integument is of a dark-red color, and there is considerable swelling and infiltration in the neighborhood of the pustule. Around the sore secondary vesicles, or satellites, are arranged in circles more or less regular in outline. The parts most commonly attacked are the face, arms, and hands, particularly the dorsal surface. There is another form in which charbonous disease appears, called malignant edema of the eyelids, in which the integument is hard and swollen. At first the swelling appears to be only edematous, the skin is not discolored, and there is scarcely any pain or itching. In the course of twenty-four or forty-eight hours they become hard, the two lids approximate, and it is difficult to expose the eye. Little blisters soon form and break, leaving a gangrenous surface. Malignant edema is most often observed upon the eyelids, but may occur upon the lips, tongue, upper limbs, and breast. The constitutional symptoms are usually pronounced in both forms, but are more serious in the latter. The systemic symptoms may be entirely absent, or there may be fever, delirium, and even a typhoid state, ending in death. The fatal result takes place from the sixth to the ninth day, though it is not uncommon at the end of the fourth or fifth day. Death is usual if the case is untreated or mismanaged, but in rare instances spontaneous cure has been observed. The anthrax bacillus can be detected in the lesions, the blood cultures, and also in the feces.[1]

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[1] Münchener Medizinische Wochenschrift, February 10, 1891.

The local lesion, according to Davaine, begins on the first to the third day after inoculation as an elevation of the epiderm, a vesicle seated in the stratum mucosum, and contains a blackish serum full of bacteria. The derm is soon involved, infiltrated with organisms, and an area of necrosis results. Bacteria are likewise abundant in the eschar, and the surrounding edematous cellular tissue, whence they and their toxins find their way into the blood.[2]

Post-mortem examination reveals extensive change in the parts involved, as well as in the various tissues and organs of the body. The blood is black and has lost its property of coagulation. The venous system is engorged. The spleen is enlarged, black and softened. The mucous membrane of the bowel, and sometimes of the stomach, is studded with ecchymoses and patches of gangrene. Many congestive or apoplectic foci are found in the lungs. Bacilli are present in the blood, spleen, lymphatic glands, and marrow of the bones.

The characteristic anthrax bacillus is an aërobic organism, staff-shaped, comparatively large, sometimes isolated, at others joined together, straight or curved, in the form of a crosier. It develops rapidly under cultivation and takes the form of long, twisted threads.

**Treatment.**—The best treatment consists in sustaining the system with food, and stimulants, as whiskey, ammonia, and ether. Quinine and ipecacuanha are both indicated in large and frequently repeated doses. Local treatment is absolutely necessary; the papule, vesicle, or pustule should be at once excised and afterward cauterized, either with the actual cautery, the galvano-cautery, or with one of the mineral acids. Mr. S. L. Woolmer reports excellent results from destruction of the lesion and some surrounding healthy tissue by means of the actual cautery without previous excision. He insists that the application should be thoroughly made, as otherwise the growth of the pustule may be greatly accelerated. Of forty cases so treated, he lost but one, and this he did not see until the tenth day, and great prostration had existed from the first. Dr. Lande obtained a favorable result in two cases from the injection of a ten-per-cent. solution of phenol in glycerin and water thrown into the subcutaneous tissue around the border of the anthrax. In less severe cases, a five-per-cent. solution would probably be sufficiently powerful. The treatment, though very painful, was followed by rapid improvement. The injections were made at five different points, and represented a total dose of fifty cgm. (seven and three-quarter grains). They should be repeated until threatening symptoms begin to abate. An anti-anthrax serum is prepared by Sclavo, but cannot be obtained in this country. Royer has obtained good results from its use. Serum treatment alone seems to be curative in some cases.[1] Compresses moistened with corrosive chloride of mercury are to be kept in contact with the lesions. Dr. Rinonapoli advises the injection into and around the seat of the pustule of a ten-per-cent. solution of iodoform in ether. Severe burning pain is occasioned, but is said to be not of long continuance. Improvement is so rapid that the treatment may almost be regarded as specific.

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[1] Franklin Royer: Therapeutic Gazette, 1907.

[2] Leloir and Vidal, *op. cit.*

Barlach[2] approves of the method of Lejars of the resort to thermo-cautery, or galvano-cautery, with subcutaneous injections of tincture of iodine. He prefers to encircle the vesicles with a deep groove, by plunging a fine-pointed thermo-cautery into the skin repeatedly until the lesion is isolated from the surrounding skin. A deep crucial incision is then made. Subsequently the cautery is not repeated. At 5 to 6 cm. from the pustule he makes a series of injections of a few drops of tincture of iodine, using in all about twenty minims, to encircle the lesion. This injection may be repeated on successive days in grave cases. Edema may be relieved by incisions. In an interesting and erudite communication, Dr. H. W. Blanc, of New Orleans, identifies the disease of the Egyptian plagues with anthrax.[3]

Equinia.—Equinia, also termed glanders and farcy, is a specific contagious affection caused by inoculation with a virus derived from the horse. It is an infectious granuloma. The disease is characterized by inflammation of the nasal and respiratory mucous membranes, together with the lymphatics and skin. In the course of a few days to several weeks after inoculation marked constitutional symptoms arise. There may be headache, *malaise*, chill, and pains of a rheumatic character, followed by the appearance of an erysipelatous eruption around the inoculated part. Vesicles, pustules, and papules, and tubercular formations develop, and break down, exposing gangrenous tissue, or unhealthy, discharging ulcers. The lymphatics become swollen and inflamed, and bullæ appear in various portions of the body, followed by suppuration and destruction of the tissue. Large and painful hardened masses of cell collections can also be detected in the subcutaneous tissue, which break down and ulcerate. The nasal and respiratory passage and the contiguous mucous membranes become inflamed. A yellowish and muco-purulent and later bloody discharge takes place from the nostril, the glands become swollen, and unhealthy ulceration and gangrene of the mucous membrane follow. The inflammation may extend to the buccal cavity and the throat, and the patient may die from the grave constitutional involvement, or from the disease affecting the glottis. The skin and mucous membrane may or may not be affected at the same time. The disease is not common; it is contagious, being produced by direct contact or through various media, which contain the peculiar virus. Bacilli (*bacillus mallei*) have been found in the blood and pathological products of individuals suffering from glanders.

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[1] Schwartz and Royer: Transactions Phila. Academy of Surgery, 1905.

[2] Münchener Med. Woch., April 9, 1907.

[3] New Orleans Medical and Surgical Journal, July, 1890.

**Treatment.**—The chief treatment consists in sustaining the patient with food, stimulants, and by the employment of large doses of the tincture of the chloride of iron and quinine. The local treatment mainly to be relied upon is cleanliness, by using gauze compresses moistened with solutions of the corrosive chloride of mercury. In two cases, Gold has obtained satisfactory results by incising the phlegmonous areas, dressing the wounds with corrosive sublimate (1:1,000) and iodoform gauze, and, in addition, practicing a course of mercurial inunctions. The nasal cavities should be frequently cleansed with injections, and the lesions cauterized thoroughly and afterward treated with suitable soothing applications.

ORIENTAL SORE;[1] DELHI BOIL, GAFSA BOIL, ALEPPO EVIL, AND BISKRA BOUTON.—The above diseases occur endemically in India, Aleppo, Algeria, and other foreign countries. In Persia, the lesion is known as the Bagdad button, since it is very common there; it is said that no one escapes it; even visitors may be affected after a few hours' stay. It begins as a painless papule and soon becomes an ulcer, which refuses to heal for 12 or 13 months. It finally heals leaving a distinct scar which is the "button." This disease has been described by Farquhar, Willemin, Geber, Tilbury Fox, D. D. Cunningham,[2] and others, to whose writings for a more detailed account the reader is referred. Fox, who has given a most careful account of them, believes that it is allied in many particulars to carbuncle. J. H. Wright[1] has found a piroplasma in the juice of an oriental boil; but attempts to cultivate the organism or to inoculate animals, have been unsuccessful. It is constantly present and distinguishes Delhi boil from craw-craw, in which it is absent. It is probable that the disease is communicated to man by some bloodsucking insect. It is very chronic, appearing usually first as a papule or tubercle, which suppurates and finally ulcerates. The disease has a stage of incubation, though the usual length of this period has not yet been determined. It may appear as a primary affection or may follow various cutaneous lesions, such as acne, impetigo, burns, vaccination, or even the sting of an insect. During the months of September and October, especially, trifling wounds may be transformed into this malady, which by preference attacks the face or limbs and is rare upon the trunk. A number of lesions may develop consecutively in the same region and may blend to form a single ulcer. The ulcer, accordingly, may enlarge by peripheral extension, or by the coalescence of several tubercles. In the beginning the ulcer is covered with a yellowish, greenish, or blackish crust. When this crust is removed and the surface cleansed it is seen to be studded with irregular granulations. In the commonest form of the affection, the lesion is papulo-crustaceous, in a second the ulceration is deep and extensive, while in a third the granulations are exuberant and assume a papillomatous or villous aspect. Complications are unusual, though lymphangitis, phlebitis, or erysipelas may occur. When it attacks debilitated persons or drunkards it may prove fatal. The duration of the disease is from three months to a year. Heydenreich groups these several manifestations under the title of "tropical boil." He has isolated a microbe which he believes to be causative of the affection. This organism, discovered by Heydenreich in an epidemic which raged among Russian troops stationed on the borders of Afghanistan, is identical with that detected by Duclaux in the Biskra bouton. The disease is inoculable and auto-inoculable, as has been shown by Laveran, Hickmann, and Weber. One attack does not insure absolute immunity. It has been surmised that flies and mosquitoes act as carriers of the contagion. Riehl and Paltauf found numerous organisms in the embryonic cells of the granulation tissue, encapsulated and recalling the appearances described by Cunningham. Chantemesse has found a microbe analogous to that of Duclaux and Heydenreich. Wright found well-defined bodies 2 to 4 m. in diameter, each containing protozoa, in a lesion to which he gave the name of *helcoma tropicum*. The parasitism of the disease can not be questioned.[2]

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[1] See also "Gangosa," under "Diseases of Mucous Membranes."

[2] They are said to be due to a peculiar form of parasitic organism. (See researches by Dr. Cunningham, Indian Medical Gazette, February, 1886.)

**Treatment.**—If this disease occurs in a debilitated individual the system should be supported by means of iron, quinine, strychnine, or cod-liver oil. As regards the sore, it should be dressed, after the crust has been removed, with tannin, iodoform, iodol, thymol iodide, or covered with an antiseptic dressing of phenol hydrate or corrosive sublimate. It would be good practice to attack the ulcer radically by the actual cautery or caustic potash. Liquid air would possibly be useful, as it is in anthrax. Application of potassium permanganate to Aleppo button is a simple method, which has been successful in 8 cases reported by Benoit.[1]

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[1] Nattan Larrier: La Presse Médicale, 1907.

[2] Hyde and Montgomery.

Abscessus.—Cutaneous abscesses are circumscribed cavities containing pus. They occasionally arise from some systemic derangement, but are generally the result of local irritation or intense inflammation in connection with other diseases of the skin. Abscesses appear sometimes in connection with eczema, acne, scabies and pediculosis. They may be formed on all regions of the integument, but are ordinarily seen on the scalp, face, neck, back, and axillæ.

**Treatment.**—Abscesses may require to be treated upon antiphlogistic principles. They usually only need to be opened and their contents allowed to escape. Their course largely depends upon the virulence and activity of the pyogenic bacteria (varieties of staphylococcus and streptococcus), usually a mixed infection occurs.

During the early stage suppuration may be prevented, it is said, by the application of a yeast poultice upon the surface. Frictions of an ointment containing about two drachms (8 gm.) of salicylate of bismuth to the ounce (32 gm.) of lanolin are also recommended, with, internally, a moderate dose of calomel. Prior to maturation we may endeavor to prevent or limit the formation of pus by the application of an ointment consisting of mercury rubbed up with an equal part of lard, with the addition of a suitable amount of extract of belladonna or opium. A mixture of equal parts of the fluid extract of arnica root, soap liniment, and laudanum is also serviceable in the formative stage. After incision, some antiseptic powder or solution may be applied to the surface. Small abscesses may be aborted by ice poultice, or by liquid air applications.

Wounds and Contusions.—The skin and deeper structures may be incised, lacerated, contused, or bruised and punctured, in numerous ways, and may occasion slight or severe constitutional symptoms. The treatment in all instances is to be conducted upon general principles.

The unsightly discolorations due to ecchymosis or diffused blood may be prevented by applying the tincture or a strong infusion of capsicum annuum mixed with an equal bulk of mucilage of acacia, with the addition of a few drops of glycerin. This combination should be applied to the surface with a camel's-hair brush, allowed to dry, and the same procedure be repeated once or twice or when necessary.[2]

There are, however, two very important forms of wounds of the skin, which demand special consideration—viz., dissecting and poisoned wounds.

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[1] La Presse Médicale, Aug. 24, 1907.

[2] Therapeutic Gazette, June 16, 1890.

DISSECTING WOUNDS.—Dissecting wounds are usually due to direct inoculation from dead bodies, mostly during post-mortem examinations and dissecting, but also may result from surgical operations upon dead bone, or other infected tissues. The symptoms may be local, or both local and constitutional. The latter may be both severe and grave. Commonly, however, dissecting wounds occasion only a local inflammation. Inoculation may occur through an existing abrasion, or a wound made with the instruments used, or in handling the body. A vesicle, pustule, or other lesion may form, followed by redness, infiltration, burning, itching, and pain. Occasionally there will be in addition more or less systemic disturbance; the pain will pass up the arm as far as the axilla, and lymphangitis follow. Rarely the constitutional involvement may become marked, and typhoid symptoms supervene and death occur.

The condition of the system, doubtless, has much to do with the occurrence of dissecting wounds. When the nervous force is depressed, the liver inactive, the blood loaded with excrementitious products, when a rheumatic, gouty, scrofulous, or tuberculous diathesis is present, or the kidneys are unsound, an accidental prick received in making an autopsy is likely to be followed by grave consequences, or even death. Examples illustrating this statement have occurred in several instances in Philadelphia. On the other hand, when the organism is in vigorous health, evil results seldom follow such accidents, which are of daily occurrence in the dissecting and post-mortem rooms. I can speak from personal experience on this point. During a service of twelve years in anatomical rooms and in conducting necropsies, I have often been wounded, sometimes rather severely, but in no instance did any but the most trifling inflammation follow. Dissecting wounds acquired during examinations of affected animals may give rise to fatal anthrax, glanders, or tetanus.

**Treatment.**—The moment the wound occurs the part should be sucked by the patient and then incised and allowed to bleed freely, using dilute hydrogen dioxide to wash the wound. The author can state, from practical experience as an anatomical demonstrator, that wounds treated in this manner, heal rapidly without the least bad effect. I have yet to see a single instance in which a dissecting wound so managed caused any local or constitutional symptoms. If the wound has not been attended to in time, it should be cut open, sucked, and allowed to bleed freely and afterward cauterized, the chloride of zinc being the very best caustic to employ for this purpose.

POISONED WOUNDS.—Poisoned wounds may be inflicted by insects, animals, and the bite of man. Flies, bees, wasps, spiders, scorpions, and snakes, by their bites or stings, produce all forms of lesions on the skin and severe inflammatory action. Bites of inferior animals, as rats, mice, cats, etc., and of the dog and horse, are also poisonous. No wound is so frequently venomous as that produced by the human bite, and it is also occasionally followed by severe constitutional symptoms. The true skin may simply be denuded by the contact with the tooth, or the tooth may make a punctured wound. Poisoned wounds may also be caused by birds, fishes, and other living things besides those which have been mentioned. The symptoms which arise from wounds so produced are frequently of an erysipelatous nature, followed by profound general depression. Abscesses and mortification may follow, necessitating amputation of the affected part, and in some instances producing pyemia and death. The internal treatment is opium for the pain, mercury when necessary, and stimulation with whiskey and carbonate of ammonium. In very serious cases it may be necessary to resort to hypodermic injections of a stimulant, or a fluid drachm (4 gm.) of a one-per-cent. solution of permanganate of potassium, as suggested by Lacerda, which, he claims, acts decidedly in a very few minutes. The local treatment of stings of insects consists in the use of solutions of bicarbonate of sodium, betanaphthol, corrosive sublimate, ammonia, and tincture of witch-hazel, and of camphor. Solutions of phenol and thymol are also useful. The application of moist clay or earth is a popular and valuable remedy also for both stings and bites. Poisoned wounds inflicted by bites of the inferior animals are frequently best treated by emollient poultices, lotions of lead-water and laudanum, leeching, or free incisions. The latter should be used early and effectively.

ULCERS.—Ulcers are suppurating sores extending to various depths. They may be acute or chronic. An acute ulcer is rapid in its course, and attended with the symptoms of acute inflammation. It may invade the skin alone, or the skin and subcutaneous connective tissue of any part of the body. It is variable in size and shape. It is generally oval, circular, or irregular, but may be creeping, serpiginous, or angular in form. The surface of the sore may have a red and inflamed appearance, or be red in certain portions and white in others. The base of the ulcer, particularly if the inflammatory action is high, may present a brownish or even blackish hue, and the discharge may be of a serous, purulent, or bloody character. The edges of acute ulcers may be straight, thin, undermined, everted, or ragged. They may be complicated with sinuses. The surrounding integument manifests all the local symptoms of inflammation, being reddened, swollen, and attended with more or less pain. There is usually some constitutional disturbance, which sometimes may be most severe.

Chronic ulcers partake of all the phenomena of chronic inflammation. Their seat, number, shape, size, and appearance will vary greatly. They are mostly confined to the leg, at its lower third and inner surface. They are usually solitary, and, like the acute, may be of all sizes and shapes. The color of the ulcer, as in the acute, may vary from a deep red to a livid, and the integument around may likewise present all the phenomena of chronic inflammation. The surface of the ulcer may present a red, raw, irregular appearance, and one portion may be deeper than another.

Granulations may be wanting, the bottom of the sore being covered with a sanious exudation, or they may develop exuberantly, presenting an unhealthy appearance, commonly known as proud flesh. The surface may incline to bleed on the slightest manipulation, and the insensitive or excessively sensitive to touch or motion. The edges may be elevated, everted, inverted, or undermined. They may be thick, thin, or ragged; hard, callous, insensible, or very sensitive. They may degenerate into malignant disease, and may be attended with some constitutional disturbance.

Acute ulcers may be caused by a depressed condition of the system, colds, and excesses of various kinds. They, as well as the chronic ulcers, are frequently induced by many other diseases of the skin. Varicose veins, especially in elderly people, are very often productive of chronic ulcers. Du Castel describes a species of ulcer associated with varicose veins, and occurring generally in young persons, dependent upon disturbed innervation of the limb, rather than upon the condition of the vessels. The ulcers are not very deep, and usually heal without difficulty. Fractures, wounds, and other injuries may likewise cause them.

**Treatment.**—Ulcers, particularly the acute, require to be treated both medically and surgically. Rest in the recumbent position is essential; blood-letting, cathartics, aconite, antimony, or other similar agents, should be employed to lessen vascular action, and opium when necessary to relieve pain. A change of air, stimulants, and tonics may be demanded, and complications should be corrected. Small doses of opium several times a day are of efficacy in promoting the cure of painful and chronic ulcers. Phagedenic ulcers are also decidedly benefited by a grain or two (0.06 to 0.12 gm.) of opium every three hours. The administration of chalybeate tonics will aid the repair of chronic ulcers. The part or limb, if possible, should be elevated and kept at rest, and bathed occasionally with hot water. Light compression can also be made with a muslin or gum bandage. The latter and the woven-gum stocking are more useful in the chronic ulcer. In place of the thin rubber bandage a sheet of "gutta-percha paper" has been used with satisfactory results. The surface should be first cleansed by an antiseptic solution; the gutta-percha, after having been washed in the same solution, is then applied, covered by a thin layer of cotton-wool, held in position by a light bandage. Warm medicated lotions, particularly those containing lead-water and laudanum, or tincture of witch-hazel, are valuable. The application of weak lotions of chloride of zinc, hydrogen dioxide, the acid nitrate of mercury, or a strong solution of nitrate of silver, may be beneficial in both the acute and chronic varieties. Pyoktanin is a good antiseptic and stimulant application to chronic ulcers. This substance may be used in the form of a two-per-cent. powder, moulded into pencils, or in solution. If these pencils are broken, the disrupted surfaces should be moistened with water and gently pressed together, which causes them to cohere when they become dry. The powder is made by mixing the methyl-violet with talc or other inert material, and the solution may be of the strength of one to a thousand or one to five hundred parts. The stain which this substance leaves upon the hands or linen may be removed by washing with a ten-per-cent. solution of Castile soap in alcohol, also with the alcoholic solution of green soap, dioxide of hydrogen, alcohol, Cologne-water, Labarraque's solution, dilute hydrochloric or nitric acid. The employment occasionally of a poultice has a soothing action upon an irritable ulcer. Local depletion of the ulcer is also valuable; the engorgement is lessened, and the application of other agents to it are rendered more effective.

The various soothing, astringent, and stimulating ointments and plasters are alike serviceable in both the acute and chronic forms. Dr. A. H. Newth states that an ointment containing twenty grains (1.30 gm.) of acetanilid to the ounce (32 gm.) of lanolin allays the pain of irritable ulcers. This is also useful in allaying pain in ulcerating epithelioma. Stramonium or cocaine ointment also has the same influence. The subiodide of bismuth is a good antiseptic application to ulcers, and may be used as a powder or incorporated into an ointment. Other substances particularly useful are iodoform, iodol, thymol iodide, europhen, betanaphthol, camphorated naphthol, and salol. Chronic ulcers may be stimulated by eucalyptus, balsam of Peru, hydrastin, naphthalin, iodosulphate of cinchonine, quillaia, mercuric, cadmium, or nickel oleate. A five-per-cent. mixture of scale-pepsin with lanolin will clean the surface of old ulcers. Foul and unhealthy ulcers are benefited by the application of aluminium oleate, resorcin, styrone, eucalyptus, salicylated camphor, hydrastin, benzoic acid or benzoate of bismuth, or sulphurous acid. A substance styled "dermatol" has lately been brought forward as a desirable addition to the list of local disinfectant remedies. It is a subgallate of bismuth, an odorless, insoluble, and astringent powder.

Dr. E. Diver has advantageously utilized chlorine gas in the treatment of ulcers. The gas is readily generated in a pickle jar by the reaction of potassium chlorate and hydrochloric acid. A layer of cotton-wool, impregnated with the gas, is bandaged upon the affected limb. A four-increasing to six-per-cent. oily solution of thiocol has been used with good results by Dr. Duffy, of Dublin. The surface is then covered with a strip of protective and an antiseptic dressing. Jequirity infusion often acts promptly and decidedly in setting up an acute reparative inflammation in obstinate cases, leading to a permanent cure.

Galvanism and skin-grafting are to be recommended in old chronic ulcers, after the surface of the ulcer has assumed a clean, granulating appearance. Sponge-grafting will also, in some cases, prove successful, while Dr. Nesterovsky and others have reported very satisfactory results from grafting with pieces of skin taken from th [illegible] n water frog, following the method proposed by Dr. Allen in 1884. The advantages of frog's skin are that it is free from glands and hair, and is easily obtainable.[1]

Autoplasty has been successfully practised in some instances. A flap or flaps are taken from an adjacent or accessible region, with which they are allowed to retain their connection by means of a pedicle. When the graft is successful the pedicle is divided. Two patients operated upon in this manner for extensive ulcers of the leg were shown to the French Academy of Medicine by M. Berger. This method aims not only to obtain a firm scar, but also to furnish the limb with normal skin, together with subcutaneous connective tissue.

In several cases of extensive ulceration Dr. Z. J. Lusk, of Warsaw, N. Y., has successfully employed pieces of exfoliated epithelium from the patient's own body, the fragments, prior to use, being softened and sterilized in a warm boric-acid solution. This writer and others have also, in a similar manner, utilized the epidermis raised by fly-blisters. A method devised by F. von Mangoldt, and termed "epithelial sowing," consists in scraping the epithelium from any healthy cutaneous surface, and placing the mass of cells, mixed with a little extravasated blood, upon the ulcer.

The most satisfactory results are obtained in old and stubborn ulcers by the process of skin-grafting introduced by Thiersch. In this method long slices, including the epiderm with about a half or third the thickness of the true skin, are shaved from the thigh by a razor and bound upon the ulcerated surface. In removing the strips the skin must be stretched and held flat. Before operation the thigh must be thoroughly disinfected. As they are removed the strips are placed in a half-per-cent. solution of table salt, from which they are transferred to the ulcerated surface. Unhealthy granulations must be scraped away before the grafts are placed in position. After the grafts have been applied they are covered with rubber tissue moistened with the salt solution, and these are overlaid with compresses wet with the same fluid. The dressings are changed every second day, and at the end of a week dry applications can usually be substituted. This process of grafting accomplishes its results much more rapidly than the older methods, and the cicatrices formed are more pliable and less unsightly. Another method, devised by Dr. F. Krause, of Altona, consists in the implantation of a cutaneous flap generally taken from the inside of the patient's thigh, and which may be as large as eight or ten inches in length by two inches in breadth. Before the transplantation the ulcerated surface is cleared of indolent or unhealthy granulations, and carefully cleansed with an antiseptic solution. It is directed that the flap should be a third larger than the defect, in order to allow for shrinkage.

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[1] British Medical Journal, June 1, 1889.

M. Ollier has successfully grafted flaps as large as 8 to 16 square inches, the wound healing without cicatricial formation and the skin preserving its natural appearance.

In a case of large ulcers due to a burn, Dr. M. E. Van Meter, in addition to ordinary skin-grafts, employed pieces of skin taken from two puppies of the Mexican hairless breed. The puppy grafts proved superior both as regards the number which thrived and their rate of growth. Mr. Alexander Milro, of Edinburgh, in a similar case, obtained satisfactory results by transplanting strips of skin taken from the abdomen of a greyhound puppy.

## CLASS V.

## HYPERTROPHIES.

(*Hypertrophiæ.*)

### LENTIGO.

SYNONYMS.—Ephelis—Sommersprosse—Freckles.

LENTIGO is an excessive circumscribed deposit of pigment in the skin, appearing as small, brownish, or blackish spots, situated commonly on the face and the dorsal surface of the hands and arms, or on portions of the body that are much exposed to the sun's rays.

**Symptoms.**—This familiar affection is observed as round or irregularly-shaped spots, varying in size from a pin's-head to a small pea. They vary in color from a light yellow to a yellowish brown or black, and often, when closely distributed, give the skin a dirty or disfigured appearance. The lesions may be either isolated or aggregated, and tend to coalesce. Their favorite seat is the face, particularly the forehead, nose, and cheeks, but they also appear in numbers upon the backs of the hands, neck, shoulders, and forearms, and other portions of the skin which are uncovered and exposed. They are, however, observed, at times, upon regions of the body which are covered, as the buttocks and penis. They occur in both sexes and at all ages, but are seldom seen before the third year. Persons with fair skins, and particularly those with red hair, are especially liable to their development; nevertheless, they appear in brunettes and mulattoes. Freckles are usually more conspicuous in summer, as at that season they generally appear, lessening or disappearing in the winter, often to reappear the following summer. In some cases, however, they apparently are influenced neither by light nor heat, and are as intense in color in winter as in summer. Freckles are unaccompanied by subjective symptoms. They are chronic in course, continuing for years, but with advancing age they may disappear permanently. They may occur as the result of, or in connection with, other skin diseases.

**Pathology.**—A freckle is shown by microscopical examination to consist essentially of a circumscribed collection of normal pigment in the rete mucosum. Chloasma differs from it simply in the shape and size of the patches.

**Etiology.**—The disease is not due to any constitutional disorder, and is in some cases probably the result of slight peripheral nervous disturbances. Heat, especially that of the sun, and the high winds of the spring and fall months, are exciting causes.

**Treatment.**—The treatment of freckles consists in the application of a mild stimulating or caustic agent, which will either excite the skin to healthy action or will destroy the affected areas, and thus cause the epidermis to be reproduced in its normal condition. Copper oleate, in from five to sixty grains (0.30 to 4 gm.) to the ounce (32 gm.) of lard, lanolin, or rose-water ointment, is an excellent combination. Salicylic-acid ointment, five grains (0.30 gm.) to the ounce (32 gm.), is also valuable. Corrosive sublimate, in from two to five grains (0.12 to 0.30 gm.) to the ounce (32 gm.) of a fatty base, or simply dissolved in water, is an effective application. A preparation composed of one drachm (4 gm.) each of white precipitate and subnitrate of bismuth and four ounces (128 gm.) of glycerite of starch has been recommended.[1] Electrolysis has been used, the needle being superficially inserted over the freckle. Galvanism may also be applied frequently with decided effect. Another useful method consists in touching each spot with strong phenol; as a result the epidermis within a few days peels off, leaving a slightly red but clear skin, which soon becomes perfectly normal. The tincture of myrrh and a decoction or fluid extract of the root of smart-weed (polygonum bistorta) have likewise been employed for removing freckles. (The Canadian polygonum, of which the root is used, is the *bistorta*. In the United States the name smart-weed is usually applied to *polygonum hydropiper*.)

The following combination has been employed with good results:

| | | | | |
|---|---|---|---|---|
| ℞ | Zinci oxidi | ʒij. | 8. | |
| | Hydrargyri chlori corros. | gr. iij. | 0.18 | |
| | Aquæ hamamelidis dest. | fʒij. | 8. | |
| | Glycerini | fʒiij. | 12. | |
| M. | Sig.: Apply once a day. | | | |

Freckles may also be removed by the use of the following lotions:[2]

| | | | | |
|---|---|---|---|---|
| ℞ | Zinc. sulpho-carbolat. | ʒj. | 4. | |
| | Glycerini | f℥ij. | 64. | |
| | Sp. vini rectif. | f℥j. | 32. | |
| | Aquæ aurant. flor. | f℥jss. | 48. | |
| | Aquæ rosæ q. s. ad. | f℥viij. | 256. | M. |

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[1] L'Union Médicale, March, 1889.

[2] *Idem.*

## CHLOASMA.

Synonyms.—Melanoderma—Liver-spot—Moth-patch.

Chloasma is a pigmentary disease, attended with partial or general discoloration of the skin, but usually appearing as one or more smooth, yellowish-brown or blackish patches, round or irregular in form and size.

**Symptoms.**—Chloasma is simply the result of an abnormal deposition of pigment in the rete mucosum. It may involve part or all of the surface. It usually appears as one or more smooth patches, of various shapes and sizes, but commonly round or irregular in form and moderately well defined. Their color may vary from light or dark yellow to brown or even black (melasma, melanoderma). They may be either idiopathic or symptomatic. The former are due to external causes, which occasion long and continued determination of blood to the skin, as scratching in eczema, scabies, and urticaria, the discoloration following being somewhat diffuse, and of a grayish or brownish hue. Injuries from blows and wounds, friction and pressure from clothing, shoes, trusses, belts, and other substances, the action of chemicals and the use of sinapisms and blisters, may occasion either a slight or severe discoloration. Heat and cold, as from the sun's rays, fires, frost-bites, and high winds, are all active agents in bringing about pigmentary changes of the skin. Chloasma of the buttocks has been observed in France, in market women, who sit on a box heated with charcoal.

The symptomatic form of chloasma occurs as the result of various changes of the system, and of diseases of the organs, as tuberculosis, especially of the suprarenal bodies, cancer, malaria, syphilis, and uterine and ovarian affections. The pigmentation may be circumscribed, general, or diffuse, varying from a pale brown to a brownish olive or bronze hue. The discoloration is more conspicuous upon those parts in which there is a natural tendency to it, as on the face, dorsal surface of the hands, axillæ, nipples, genitals, and even the hair. Bronzing of the skin may follow the prolonged administration of arsenic. It is a marked symptom of Addison's disease and occasionally also in Hodgkin's disease. Chloasma may likewise appear during the course of scleroderma, morphea, senile atrophy, etc. The most frequent of the symptomatic chloasmata which require special mention are those which develop from uterine and ovarian affections, and which will be described as follows:

Chloasma Uterinum.—This form of the disease usually involves the face, especially the temples, forehead, and eyelids. The pigmentation may be slight or severe, but is particularly marked in those of a dark complexion. The disease may be transien [illegible] aring within a short time, or it may remain permanently. [illegible] as one or more patches, of all forms and sizes, u [illegible] extending continuously or interruptedly from [illegible] scalp to above or below the eyebrows, or to and upon the lids; the trunk, particularly about the nipples, may at times also be involved. The patches vary in color from a pale or muddy yellow to a brown, and they may be well or poorly defined, occasionally passing indistinctly into the surrounding healthy skin. The surface is, as a rule, smooth and natural, but seborrhea may occasionally exist at the same time. The patches may, especially during pregnancy, be so extensive as to cover the whole region, or almost the entire surface, giving it a diffuse discoloration which may be mistaken for the healthy skin, while that of the normal tint which remains may be regarded as diseased.

Chloasma uterinum may occur in both married and single women, but is seldom observed after the climacteric period. It appears particularly in connection with hysteria, pregnancy, and various uterine and ovarian affections, as amenorrhea and dysmenorrhea. It usually disappears upon the removal of the exciting cause.

**Diagnosis.**—Chloasma is liable to be confounded with *chromophytosis* or *tinea versicolor.* In chloasma the patches are usually single, unless the disease is general, appearing mostly on the face, while in chromophytosis they are multiple, rarely invade the face, but commonly occur on the trunk. The surfaces of the patches of the two affections are likewise dissimilar, those of chloasma being smooth and exhibiting no alteration in structure, while those of chromophytosis are hyperemic and furfuraceous, as shown by scraping the parts with the fingernail. The microscope demonstrates chloasma to be pigmentary, and chromophytosis to be parasitic. Lastly, the patches of chloasma, having become fully formed, spread slowly, if at all, and have rarely any subjective symptoms; on the other hand, chromophytosis usually develops rapidly, and is commonly attended with itching. In *seborrhea nigricans* the discoloration is on the surface and can be wiped off; in chloasma, it is in the pigment layer of the skin.

**Pathology.**—The seat of the increased pigmentary deposit is the rete mucosum.

**Etiology.**—The affection appears at all ages and in both sexes, but is more common in women. Disorders of the internal organs, malaria, and certain blood affections, particularly anemia, are its most frequent exciting causes. It may also be produced by profound excitement, and many nervous diseases. Local irritation or inflammation may produce the disease, as, for example, the pressure of a hat, bonnet, or a band. Sometimes it is the result of eczema, erysipelas, and other cutaneous affections.

**Treatment.**—The treatment applicable in lentigo is also suitable in chloasma. The general or local cause should, if possible, be r
order that the topical applications may act effectually. As
is deposited in the rete cells, the object of the local treatm
the epidermis containing them and thus remove t

selecting local remedies avoid the use of mustard, mineral acids, cantharides, croton-oil, or any other substance which may excite pigmentation. Among the many suitable drugs are the tincture of iodine, acetic acid, phenol, mercurials, the alkalies, especially caustic potash, and the potash and soda soaps, veratrine, and copper oleate. The pigmentation may be easily removed by touching the spots with strong acetic acid or phenol. Hebra's method consists in dissolving five grains (0.30 gm.) of corrosive sublimate in an ounce (32 gm.) of distilled water, alcohol, or collodion, and applying it by means of a compress to the affected part for four hours. A blister results, which should be pricked and dressed with powdered starch. The epidermis falls off, and is replaced by new skin which is lighter in color, but which will not always remain permanently free from pigment. Hydrogen dioxide, applied by means of a camel's-hair brush, may be used.

Pyrozone has been used with success by Dr. Charles Allen. Pyrozone is the proprietary name of a standard solution of hydrogen dioxide in water or ether, the strength of the former being three per cent. and the latter five per cent. M. Masotti[1] described a new method of treating chloasma, freckles, and other pigmentations—scarification followed by the application of oxygenated water—which he had found most successful. In scarifying a patient suffering from acne complicated by chloasma he found to his surprise that after a few sittings the chloasma disappeared. This suggested to him the use of scarification in the treatment of pigmentation. He followed the procedure by the application to the wounds of oxygen, which has a decolorizing action. Every five days fine scarifications are made very close together on the spot which it is desired to remove. The part is then washed with warm water and a tampon of cotton-wool soaked in oxygenated water is bandaged on. On the following day erythema is produced and in some days slight desquamation. The pigmentation rapidly disappears, which M. Masotti ascribes to a double action. The scarification causes prompt renovation of the epidermis and the oxygen is brought into direct contact with the pigment on which it exercises its strongly decolorizing effect. This method has a great advantage over others that have been employed for the same purpose; it does not produce pain or irritation.

Unna suggests (Berliner klinische Wochenschrift) the following procedure: The skin is first washed off with spirit of wine, after which a mercurial plaster, prepared from white precipitate, is applied to the pigmented area and permitted to remain overnight. The next day the following combination is used:

℞ Bismuth. subnit. ......ʒjss. 6.
Kaolin .............. ʒjss. 6.
Petrolati ............ ʒvj vel ℥jss. 24. vel 48. M.

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nt of Chloasma, Freckles and Other Pigmentations by Scarifica- of Oxygenated Water." London Lancet, March 14, 1908, p. 805.

The tincture of iodine or sulphur, with acetic acid, or the application of potash soap continuously for a part or an entire day, will be very effective. Remedies may, however, be used which are less irritating and act more gradually. I prefer for this purpose either the ointment of mercuric or mercurous oleate, or one containing from thirty to sixty grains (2 to 4 gm.) of copper oleate to the ounce. The ointment of nitrate of mercury, alone or diluted, or veratria, ten to thirty grains (0.60 to 2 gm.) to the ounce (32 gm.), or an ointment containing two parts each of white precipitate and subnitrate of bismuth, as suggested by Neumann, may be employed. Corrosive sublimate, acetic acid, tincture of benzoin, tincture of soap and borax, are also valuable. The following may be used with advantage:

| | | | |
|---|---|---|---|
| ℞ Hydrargyri chloridi corrosivi | gr. x. | 0.60 | |
| Spt. vini rect. | f℥ij. | 64. | |
| Aquæ rosæ | f℥ij. | 64. | M. |

A preparation recommended by French authors is composed as follows:

| | | |
|---|---|---|
| ℞ Hydrarg. chlorid. corros., | | |
| Ammon. chlorid. | āā gm. | 0.15-0.30 |
| Emulsi. amygdalæ | gm. | 120-130 |

The application frequently of the galvanic current is one of the most suitable and effective agents, according to the experience of the author, in removing an abnormal deposit of pigment in the skin. When the bronzing is due to Addison's disease, the use of suprarenal extract has given good results, as in a case reported[1] by the author in 1901.

It is necessary, in this connection, to refer to certain other transient or permanent discolorations which resemble chloasma. A marked example of this occurs in icterus or jaundice; the coloring-matter of the bile passing into the skin changes its color to deep yellow. The main treatment, then, is that of the disease which gives rise to it. The itching and pigmentation may, however, be lessened by massage, and the simple vapor or the Turkish or Russian bath. Another instance of discoloration is ecchymosis, which may arise from extravasated blood. The treatment depends upon the exciting cause. When the extravasation and discoloration, its sequence, are due to traumatism, leeching and the subsequent application of white precipitate ointment are valuable. Discoloration of the skin may also result from the use of nitrate of silver, developing a varying shade of color, according to the quantity deposited, from a grayish slate to a blackish hue. When administered internally for a prolonged period, the staining may be over the general surface, but is more common on the mucous membrane of the gums, the face, and hands. Metallic silver is deposited in minute granules in the internal organs and the mucous membrane as well as the skin. For this condition, which is known as "argyria," the internal use of iodide of potassium has been recommended; but the results are usually negative.

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[1] Journal of the American Medical Association, March 23, 1901.

The skin may be colored in various hues by tattooing.[1] Vermilion, charcoal, gunpowder, and indigo are the substances generally used. The pigment is introduced by a needle or a series of them, and remains permanently, causing discoloration where it has been inserted. Cases showing remarkable and elaborate designs have been publicly exhibited in this and other countries. Tattoo marks may be removed by electrolysis or by the action of some cauterant, which excites enough inflammation to destroy that portion of the skin in which the foreign substance is deposited. A scar, of course, is the result of the use of a cauterant. If the tattooed area is not extensive and the cauterant has not penetrated the entire thickness of the integument, the scar may not be very noticeable, and becomes almost obliterated in course of time. Nitric acid and ethylate of sodium have also been used for their cauterizing action, applied by means of a pointed piece of wood or glass rod, allowed to remain upon the surface for a minute or two and then washed off with water. The surface may be shaved off with the razor, as in making Thiersch grafts. Dr. Variot, of Paris, claims invariable success from the use of the following maneuvres: A concentrated solution of tannin, having been poured upon the tattooed parts, is worked into the skin in the same manner as in the tattooing operation. The surface is then rubbed with a stick or solution of nitrate of silver, which is allowed to act until the prick-marks stand out as black points from the formation of tannate of silver. Any excess of liquid is then wiped off, and the surface treated soon turns black. Moderate inflammation ensues; after fourteen or eighteen days the eschar drops off, leaving a reddish, superficial cicatrix, which gradually grows paler, and at the end of two months has almost disappeared. Stains due to gunpowder may be removed by washing the skin with equal parts of biniodide of ammonium and distilled water, which causes the spots to grow gradually red. The red stains are made to disappear by the application of dilute hydrochloric acid.

Dr. Ohmann-Dumesnil advocates tattooing the pigmented surface with glycerol of papoid, six to ten fine cambric needles bound together being used as the implement.

**Prognosis.**—Chloasma only demands attention on account of the staining it occasions. It may disappear with the removal of the cause or by the application of suitable remedies. Frequently it may remain permanently, or quickly reappear notwithstanding all efforts. Discoloration resulting from metallic silver or from tattooing is usually permanent.

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Navy," by Surgeon Aurmen Farenholt, U. S. N., United
. April, 1908.

Ochronosis.—In the condition described by Virchow under the name of ochronosis, there is a discoloration of various cartilages of the body, varying in hue from a brownish-yellow to a blue-black. It is a rare disease and is only exceptionally recognized during life. Graeffner[1] reported a case in which there was a dark yellow discoloration of the head, a bluish-gray coloration of the auricles and the sclerotics presented spots of dark blue. The hands were yellow. In a second case, in addition to the bluish-gray color of the ears, there was a blue spot on the nasal septum. In both of these cases, there was a history of leg-ulcer for which weak solutions of phenol had been used for many years. Graeffner was of the opinion that the ochronosis was the result of chronic poisoning by phenol. Pick does not, however, accept the view that ochronosis arises from altered hemoglobin, as has been generally believed. He regards it as a pathologic production like melanine, which arises in the organism under the influence of a certain oxidizing ferment *tyrosinase.* Consequently it approximates the hydroxyl derivatives of benzol, which are found in the blood in alkaptonuric cases. There are two forms of ochronosis, according to Pick, the endogenous and the exogenous. The first is encountered in individuals, who present more or less autolytic degeneration of the living cells of the albuminoid substances (as in old age, rheumatic or gouty diathesis, cachexia, alkaptonuria, etc.). The second form is manifested when, for instance, there have been for a long time phenolized dressings applied; the phenol penetrates the skin and is transformed into pyrocatechin, resorcin, and especially into hydroquinone, and finally into derivatives of benzole with hydroxyl.

In cases of ochronosis, it is of great importance to make repeated analyses of the urine. This will often show striking changes. Sometimes as in the case described by Hausemen, the urine is brown or almost black, at times, and at others, it contains a substance (melano-chromogen or melanogen), which upon exposure to the air, is oxidized into melanine. So that ultimately, the urine of ochronosis, exactly as in alkaptonuria, acquires strong reducing properties; and, if it does not do so spontaneously, it will turn black upon the addition of an alkali. Examination of the blood will separate these cases from erythremia, and the urine will diagnosticate them from chloasma or jaundice.

## NEVUS PIGMENTOSUS.

Synonyms.—Nevus maternus—Nevus pilosus—Nevus verrucosus—Fleckenmal—Nevus pigmentaire—Pigmentary mole.

Pigmentary nevus, which may be congenital or acquired, consists generally of a circumscribed deposit of an excessive quantity of pigment, alone, or together with hypertrophy of the connective tissue, or of all the cutaneous structures, including the hair. Nevi are of all dimensions, but are usually small, about the size of a split pea, but exceptionally may cover a large part of the surface, as stated by Wilson.[1] They may be round, oval, or irregular in shape, and vary in color from yellow to brown or blackish. Nevi may be flat (on a level with the skin), or more or less raised. Their surface may be smooth and unaltered, and they are then known as *nevus spilus*; or rough and warty, *nevus verrucosus*; or there may be a marked connective-tissue hypertrophy, producing thick, soft, or firm variably sized growths, known as *nevus molluscaformis* or *lipomatodes*.

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[1] Berliner Medizinische Gesellschäft, July 24, 1907.

Nevi may, or may not, be supplied with a growth of hair. If hair is present, it may be soft, but more commonly it is stiff. A nevus supplied with hair is known as *nevus pilosus*. Pigmentary nevi occur in both sexes, and may be single or multiple. They appear on all parts of the body, but are most frequently met with on the face, neck, and back. Occasionally they follow the course of nerve tracts. Their growth is usually slow, but sometimes they increase in size rapidly. Hairy moles are frequently of large size. Dr. Max Joseph has described[2] a case, in which the lower part of the trunk and the thighs were covered with a pigmented mole from which grew brown hairs over an inch in length. The pigmentation was irregular. A large number of small moles were seated upon the back, chest, and face. The subject, a robust young man, was beardless, but the hair of the scalp and eyebrows was normally developed.

**Pathology.**—Pigmentary nevus consists usually of a circumscribed deposit of an excessive quantity of pigment in the mucous layer of the epidermis, with more or less connective-tissue hypertrophy.

**Etiology.**—No specific cause has as yet been assigned for the development of pigmentary nevi.

**Treatment.**—Excision is, beyond all doubt, the best method of removing all the forms of this disease. They may be removed also by ligature, or by the application of ethylate of sodium and other caustics. The galvano-cautery and the actual cautery act promptly.

**Prognosis.**—Pigmentary nevi usually continue a lifetime, and seldom disappear spontaneously. They should, unless too numerous, be removed or destroyed, as they may, according to Rindfleisch, degenerate into pigmentary sarcoma, or become converted into epithelioma.

## CALLOSITAS.

SYNONYMS.—Callus—Tyloma—Tylosis—Callosity.

Callosities consist merely of a hypertrophy of the horny layer of the skin, characterized by the formation of thickened, translucent, or grayish, yellowish, or brownish patches of various sizes and shapes, occurring most frequently on the hands and feet and around the knees or elbows, if these joints are exposed to pressure.

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[1] Wilson on the "Skin and Hair," Philadelphia, 1876.

[2] British Medical Journal, Jan. 11, 1890.

**Symptoms.**—The epidermis increases in thickness, and assumes a grayish, yellowish, or brownish color. It presents a more or less hornlike, firm, dense structure, which may be insensitive and smooth, or upon which the normal furrows and lines are less marked. Occasionally, when a large area is involved, the surface may be roughened, raised in ridges, or cracked and extremely painful. The color, appearance of surface, consistency, size, shape and subjective symptoms, if any be present, vary according to the cause. Thickening usually occurs in circumscribed patches, which are generally round, but often conform to the part which is covered. In size they vary from a five-cent piece to that of the entire region involved. They have their seat generally upon the palmar and plantar surfaces, on the fingers and toes, especially the ball of the great and the side of the little toe, or any part where pressure exists. A callosity occasionally forms beneath a toe-nail. Callosities are gradual in their development. They may remain unchanged indefinitely, or they may be complicated with a mild or severe inflammation, which may terminate in their removal. Sometimes the thickened skin, more particularly on the removal of the cause, may by spontaneous involution be restored to its normal condition. The thickening may be preceded by profuse perspiration, as in a case described by Radcliffe Crocker.[1]

**Pathology.**—The callosity is simply hypertrophy of the horny layer of the skin. Simon has shown that this change takes place in the horny layer alone, the corium remaining normal. Robinson notes that the latter is not involved to any extent, yet the excessive cell-growth must derive its basis from the vessels of the true skin.

**Etiology.**—Callosities may occur at all ages; but they are more frequently observed in middle and old age, and oftener in men than in women. They are almost always produced by external influences; but cases may appear—as, for example, on the dorsal surface of the fingers and on the glans penis—without any known cause. Percussion, pressure, or friction, or the handling of certain substances, as water and chemicals, may cause their growth. Their location frequently indicates the occupation of the individual affected, as they are often seen on the tips of the fingers in violin, harp, and guitar players. They also occur in laundresses, shoemakers, burnishers, wood-carvers, carpenters, locksmiths, wheelwrights, and farmers.

**Treatment.**—Callosities are generally a protective envelope to the parts beneath, and should be interfered with only when they occasion deformity, inconvenience, or pain. Circumscribed callosities may be relieved or cured by the application of the galvanic current or the use of static electricity. Medicated plasters of either mercury, salicylic acid, lead, or copper oleate are also useful, particularly when a large surface is thickened and painful, interfering with the occupation of the patient, as when the feet are involved. Salicylic-acid plaster, or, even better, a plaster composed of four parts of the above drug to one part of copper oleate, is especially valuable. Thin demonstrated the practical value of salicylic-acid plaster before the London Clinical Society, and Will[1] and others have likewise testified to its efficacy. Sack has been able to banish the horny tumors of palmar keratoma by bandaging them with freshly made, sweet cream cheese. The casein in this form has hygroscopic properties like glycerin. It is applied thick and covered with an impermeable dressing, left undisturbed for eight to twelve hours at a time. In a day or two the keratoma scales off to a soft, pink excrescence, which he then treats with a mixture of equal parts of borax and salicylic acid, 5 parts to 10 parts spirit. vin. and 80 parts glycerin. Lactic acid, hot water, oils, poultices, soft soap, tar, or mercury, may also be used to soften and remove callosities. The application of acids or alkalies, especially a solution of caustic potash (5 per cent.), and the employment of the knife, are effective, but should always be avoided when milder remedies are at our disposal. If inflammation arises, it should be treated upon general principles. (For hypertrophy occurring in scar-tissue, see "Keloid.")

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[1] British Journal of Dermatology, June, 1891.

## CLAVUS.

SYNONYMS.—Leichdorn—Huhnerauge—Cor—Corn.

Clavus is a more severe but localized callosity, painful on pressure, usually limited to the feet, especially in persons wearing narrow or tight shoes.

**Symptoms.**—A corn is a small, somewhat elevated thickening of the epidermis, varying in size, but usually being about that of a split pea. It may be yellowish, or yellowish-brown, in color, smooth, polished, hard, and horny, or white, flat, soft, and spongy. The former is known as the hard, and the latter as the soft, corn. Corns may occur on various parts of the body, and they may be single or multiple in number. They are most commonly met with on the feet; the toes, especially the little one, and the plantar surface are the portions generally affected.

Exceptionally a corn develops beneath a nail. Those which occur between the toes become macerated and softened by the moisture of the parts. A blister may form under one of these soft corns, and the poured-out fluid discharge from a little central opening in it, which may be followed by severe inflammation of the toe, or even the foot. All corns are attended with more or less uncomfortable feeling, or suffering, more particularly in changeable weather. There may also be a sharp, darting, or shooting pain, occasionally so great as to prevent the individual from either standing or walking.

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[1] British Medical Journal, March 29, 1884.

**Pathology.**—A corn is a hypertrophy of the horny layer of the skin in the form of a cone, with its base looking outward and its apex turned inward toward the cutis. The cone is made up of epidermic cells, arranged in concentric layers. It may have one or more projections passing down to the true skin, which are commonly referred to as the roots or cores, and which occasion pain by the pressure on the sensitive papillæ. The corium around the base of the cone may be hypertrophied, as well as the papillæ; but the latter are more frequently atrophied.

**Etiology.**—Corns, like callosities, are an effort of nature to protect the parts subjected to pressure. Pressure and friction are the causes of their development. They are usually occasioned by wearing tight or badly fitting shoes.

**Treatment.**—The most essential point of the treatment is to remove all pressure and friction from the part affected. Corns may gradually disappear or cease to occasion trouble after being thus treated. In the event that further treatment becomes necessary, they may either be removed by an operation or be palliated or caused to disappear by static electricity, galvanism, or by certain medicinal applications. A hard corn can be successfully removed by carefully separating the base with a knife from the adjoining portion of the sensitive skin, and then with a still smaller one cutting out the one or more apices or cores which exist. The entire fibrous mass may thus be lifted or pulled out in one piece. This operation requires considerable experience and skill in order to perform it successfully. Corns may be relieved and protected from pressure by pieces of cotton or felt, alone or medicated. The frequent use of hot water, or oil, or poultices to the corns, or paring off the thickened base, will also give temporary relief, and will assist the action of such preparations as alcohol, flexible collodion, compound tincture of benzoin, turpentine, nitrate of silver, and caustic potash. The compound salicylated collodion of the National Formulary, is made by dissolving extract of Indian hemp, 2 gm., in alcohol, 10 gm., and mixing this with a solution of salicylic acid, 11 gm., in flexible collodion, 50 gm.; finally adding enough flexible collodion to make the total weight 100 gm.

Among other useful applications are salicylic acid, cannabis indica, lead and copper oleate, either in the form of ointments or plasters. Corns have been destroyed also by the juice of drosera, chelidonium, or of sedum acre. The application of bichromate of potassium solution or the ointment of arsenic oleate has also proved of service in removing corns. The following combination is recommended by Gezon:

| | | | |
|---|---|---|---|
| ℞ Acidi salicylici | gr. xxx. | 2. | |
| Ext. cannabis indicæ | gr. x. | 0.60 | |
| Collodion flexilis | f℥ss. | 16. | M. |

This should be applied twice daily with a brush for several days, and the corn afterward macerated in warm water, when it may be readily removed. Instead of cannabis indica, from ten to thirty grains (0.60 to 2 gm.) of lactic acid may be substituted in the preceding formula. A good corn-plaster is made by melting six parts of resin, adding five parts of balsam of fir, and stirring in ten parts of salicylic acid as the mixture cools. The mass may be spread upon any suitable material. Another formula contains salicylic acid, purified wool-fat, cocaine hydrochloride, and creosote. The combination of acetate of copper, half a drachm (2 gm.), to two drachms (8 gm.) of Venice turpentine and one ounce (32 gm.) of yellow wax, is also said to be a useful corn-plaster.[1] In the treatment of corns upon the soles, Unna makes use of his strongest salicylic plaster-muslin which is impregnated with equal parts of salicylic acid and creosote. This is held in contact with the corn by means of glycerin jelly painted around and over it, the whole being covered with a layer of cotton-wool held in place by a light bandage.

Soft corns may be cured or relieved by cutting away the thickened skin with the scissors and applying salicylic acid in ointment, from thirty to sixty grains (2 to 4 gm.) to the ounce (32 gm.), and by keeping a piece of cotton or wool constantly between the toes.

**Prognosis.**—On the removal of the exciting cause, corns as well as callosities usually disappear and, if removed, will not return, unless the pressure is renewed. Sometimes callosities and corns are spontaneously exfoliated, especially after a fracture of the leg, or a sickness which produces a stay in bed.

Shedding of the Skin may follow fracture of the leg or other injury which keeps a patient in bed. The skin of the legs and feet may come off in large pieces, retaining the shape of the foot, looking like slippers. This is accomplished without inflammation, or applications to the skin. Certain agents like iodine or ammonia are followed by desquamation, in a few days after they are applied. Bulkley reports[2] a case of a young girl, supposed to have had scarlatina, because of shedding of her epidermis, but he discovered that she was subject to it periodically and that her father also had the same peculiarity.

## CORNU CUTANEUM.

Synonyms.—Cornu humanum—Hauthorn—Corne de la peau—Cutaneous horns—Horny excrescence—Horny tumor.

Cornu cutaneum is a hypertrophic disease of the epidermis, characterized by the formation of a true horny outgrowth of varying shape and size.

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[1] Dr. H. M. Whelpley in "Notes on New Remedies," June, 1890.

[2] Gazette, Oct. 15, 1907, p. 681.

**Symptoms.**—Horny outgrowths, which resemble very much in appearance the horns of the lower animals, are occasionally developed upon the human skin. The shape and size of these excrescences vary; they may be straight or curved, but are usually twisted in various directions, sometimes assuming the appearance of a ram's horn.

In other cases they are cylindrical, conical, or flattened in appearance. The free end may be pointed, but it is generally blunt or split up. The growth outside is solid and hard, but within it may be soft and crumbling. The surface is dry, wrinkled, and fissured. In color, horns are generally grayish, but they sometimes vary from a light yellow to a dark yellow, brown, or even black. In size they are generally small, but they may grow from one to many lines in length and thickness. Thus, Porcher described a horn which developed from the forehead of a negress, which was seven inches long and two and three-quarters inches in diameter. The bases of horns are broad, flattened, and concave, resting directly upon the skin, which is either normal, hypertrophied, or more or less inflamed. They may appear upon any part of the body, but are observed most frequently about the head, particularly on the face and scalp; their next most common situation is the genitals.[1] Drs. Jules Félix and Alfred Stocquart have described the case of a boy of ten, the entire left side of whose penis was covered with a spiculated horny growth of a dirty yellowish-white color. A spot upon the same side had presented a roughened aspect at birth. Cutaneous horns are usually single, but may be multiple, as in Boettge's cases, the one being a man who had six growths on his face, and the other a young girl the lower half of whose body was studded with them. Horns are more frequently seen on old persons than on the young. They are slow and painless in growth, and, after having attained a certain size, they are generally shed or broken off, leaving an ulcerating surface. As a rule they redevelop after having been shed, but a few instances have been met with in which there was no return. Curious cases have occurred in which such horns have been periodically shed at the end of every four, six, or twelve months. After a horn has existed for some time, or if irritated or injured, it may become painful, particularly about the base. During the period of formation and before the horn has protruded from the surface it may give rise to itching or even, as in some cases which have been reported, to severe pain, which generally ceased soon after projection of the deformity. Demarquay, in 1862, had collected the reports of six cases in which horns grew from mucous membranes—in one case from the conjunctiva, in one from the tongue, and in the remainder from the glans penis. Other cases affecting the glans have since been published.

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[1] "Report of Horny Growths on the Penis," by Pearce Gould. Medical and Surgical Reporter, March 19, 1877.

**Pathology.**—Microscopic examinations demonstrate that cutaneous horns consist of a hyperplastic growth from the stratum mucosum, which is situated either over the papillæ of the corium, or within the follicles and glands. Enlarged papillæ with blood-vessels have also been observed. The cornified epidermic cells are arranged in the form of longitudinal columns corresponding to the papillæ. These cells are at times disposed in concentric layers similar to those of epithelioma. Again, they may resemble sections of the cavities, filled with epidermic cells, seen in certain warts or sections of enlarged cutaneous glands full of cornified epithelial cells. A horn may usually be regarded as a species of papilloma or wart, the epidermic cells of which are intimately joined to each other like those of the nails and superimposed upon each other in layers. There is something suggestive of epithelioma in these growths, and in some instances malignant disease has resulted. This is especially observed in old people.

**Etiology.**—Pressure, wounds, and various other injuries to the integument may occasion the development of cutaneous horns. They sometimes originate from sebaceous cysts or warts.

**Treatment.**—Horns should either be ligated at their base or, what is even preferable, the entire growth should be excised, with a portion of the skin from which it springs, and the surface cauterized with either the actual cautery, the galvano-cautery, or with zinc chloride, arsenic oleate, or caustic potash. The x-rays may be used to aid the process of healing.

**Prognosis.**—Horns are apt to recur if they are shed, broken, or torn off from their base. Experience has shown that their removal is necessary, both on account of the deformity which they occasion and their tendency in old people to degenerate into epithelioma. If removed by the operation just suggested, they seldom redevelop.

## KERATOSIS PILARIS.

SYNONYMS.—Lichen pilaris—Pityriasis pilaris.

Keratosis pilaris is a hypertrophic disease, characterized by the appearance of pin-head-sized conical elevations about the orifices of the hair-follicles.

**Symptoms.**—The affection appears in the form of an accumulation of epithelial cells and sebaceous material about the orifices of the hair-follicles, forming minute conical elevations or papules. These papules are pin-head in size, pierced with a hair, or contain a convoluted or twisted hair, and around them the epithelial and sebaceous material is arranged in the form of laminæ. The hairs may project from the apices of the papules, or be broken off close to the surface, showing a dark or black point in their central part, or they may be invisible, being contained within the accumulated masses. In color the formations are dirty white, gray, or brown, and are situated on the skin, which may be normal in hue or reddened. The skin to the touch appears rough, harsh, scaly, and dry as in ichthyosis; the elevation, however, being marked, and in severe cases resembling a nutmeg-grater. The favorite seat of the disease is the extensor surfaces of the extremities. It is most frequently met with upon the thighs, the arms, and forearms, but it may occur as well upon all the body. It occasionally involves the face, and may produce falling of the hair of the eyebrow. The skin contiguous to the affected follicle may even become atrophic. Keratosis pilaris may be present to a slight or to a great extent. It is chronic in course, and may or may not be attended with itching.

The follicular keratosis is caused by hyperproduction and hypercohesion of the horny layers. These two processes lead to the development of all the various clinical phenomena both on the hairy scalp and the general skin surface. It is not necessary to have a stoppage of the follicles, as shown in cases reported by Samberger,[1] of Prague, who suggests that the title be changed to *keratosis pseudofollicularis* in order to better designate the pathological condition.

**Diagnosis.**—The disease is most likely to be confounded with *cutis anserina* (goose-flesh), but the latter is a transient condition arising from a temporary erection of the hair from either nervous excitement, cold, or heat, and rapidly disappears. It is to be distinguished from *lichen scrofulosus* by the latter tending to occur in groups, particularly upon the abdomen, and in the lesions being firmer and not so scaly. Keratosis pilaris may also bear a close resemblance to desquamating *miliary papular syphiloderm*, but differs from the latter in the lesions not developing in groups, and being neither so scaly nor so deeply seated.

**Etiology.**—Keratosis pilaris may be due to the physiological activity of the hair-follicles and glands which takes place at puberty. The neglect to employ water and soap sufficiently, as well as their too free use, has also been known to occasion the disease. Brocq expresses the belief that the disorder is congenital.

**Treatment.**—The moderate use of water and soap, the solution of boro-glyceride, sublimate, or, in severe cases, sapo viridis, will usually be all the treatment needed. The warm water, the alkaline, the vapor, Turkish, or Russian bath can also be used. In severe and obstinate cases, the oil of ergot, almond-oil, glycerin, and petroleum-ointment are also serviceable. A change of climate is often advantageous. A visit to a health resort where there are hot springs, as in Western Virginia, Arkansas, and elsewhere, where baths may be taken systematically under medical supervision, would be advisable in chronic cases.

**Prognosis.**—The disease quickly yields in most cases to treatment, but if not counteracted it may persist indefinitely.

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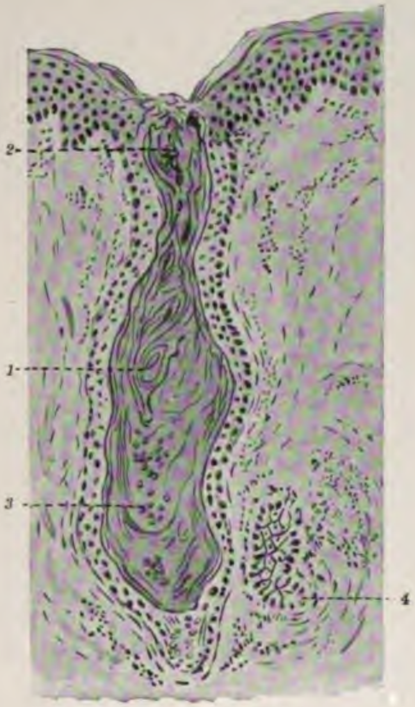
[1] Wiener klinische Rundschau, No. 32, 1906. From Casopis Ceskych lekarské, 1905. Nos. 41 and 42.

# PLATE XVII



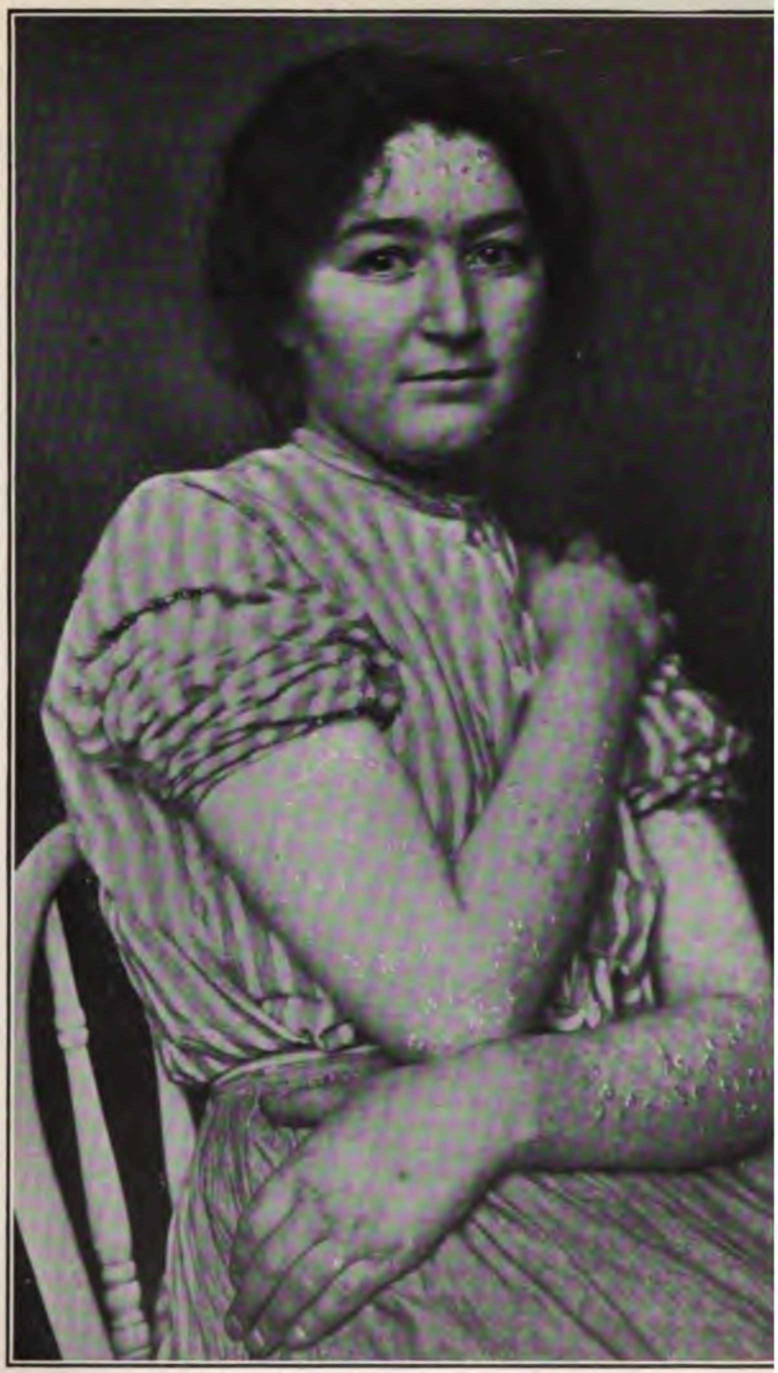
Circumscribed Hyperkeratosis affecting the Hair-follicle.

(See page 576)

*1*, Comedo consisting of an oat-shaped horny mass filling the dilated funnel of the pilo-sebaceous follicle.
*2*, The plug darkened by diffuse horn-pigment.
*3*, Sebaceous material.
*4*, Section of sebaceous gland.

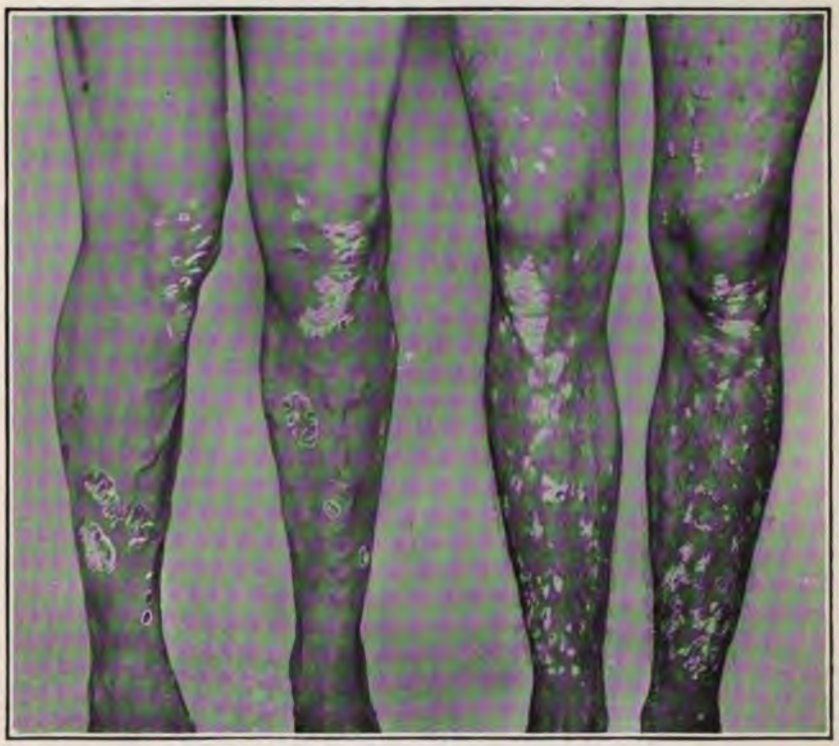
(*Modified from Macleod.*)

PLATE XVIII



Guttate Psoriasis. (See page 577)

PLATE XIX



Psoriasis of the Legs. (See page 578)

## PSORIASIS.

SYNONYMS.—Lepra—Alphos—Lepra alphos—Psora—Schuppenflecte.

Psoriasis is a chronic, inflammatory cutaneous disease, characterized by an outgrowth of the epithelial layers of the skin, and generally appearing as slightly elevated, round, and reddened patches of various sizes, covered with dry, white scales, causing marked disfigurement of the body surface. It is not attended by moisture, vesiculation, nor pustulation.

**Symptoms.**—Psoriasis usually begins with the development of very small papules covered with dry, white scales. They are present in considerable numbers, but are invariably separated by large, or small, areas of healthy skin. They are about the size of a pin's-head, and from their punctiform appearance are termed *psoriasis punctata*.

If the scales be gently scraped off, the reddened surface beneath will readily bleed. The papules may remain stationary, but generally increase in size until they are as large as lentils, and resemble in color and appearance drops of mortar; they are then designated *psoriasis guttata*.

In the mean time new punctiform points may appear in the intervening healthy skin.

When the papules attain the size of a pea or a walnut, covered with a quantity of dry, white, firmly adherent scales, and having the appearance of an ordinary coin, they are known as *psoriasis nummularis*.

Spots of psoriasis punctata or psoriasis guttata can also be recognized, scattered over the surface, which have developed while the older patches have been increasing in size. The patches in many cases coalesce, forming lesions irregular in form and of all sizes. New spots continue to break out, until the disease may cover the whole surface of the body. This condition is termed *psoriasis diffusa*, or *psoriasis universalis*. Sooner or later the masses of epidermic cells separate, partially or generally, and, in falling off, expose reddened spots, slightly raised above the level of the natural skin. In those cases in which the epidermic cells have partially dropped off from the centre, the scales remaining adherent at the margin of the patches, a circular or annular appearance is presented. As the affection progresses, the central red spots become pale, like the healthy skin, and surrounded with rings of scales, if they have remained adherent, or with erythematous areolæ, if the scales have fallen off.

The blending of these rings or segments produces serpentine lines and patterns of striking appearance. Psoriasis may remain in the condition just described, now improving and again relapsing into its former state; or it may occur—which is more frequent—as small patches scattered over the chest, and in larger spots over the elbow, sacrum, and knee. In many instances, however, patches which were large and prominent gradually lose their characteristic appearance, fade, and disappear, but are quickly succeeded by others. In addition, fresh spots crop out, and, although an alteration and change occur, yet the eruption will not undergo a cure. Inveterate or chronic psoriasis may become complicated with deep and painful fissures of the hands and feet, with warty formation or even epithelioma. In other cases, while fresh patches appear, the original ones remain, and together they gradually invade all the unaffected healthy skin. At times, but rarely, the affection may subside spontaneously. In that event the scales become less adherent, and finally fall off entirely, leaving the reddened, circular patches slightly elevated above the surrounding healthy epidermis. The redness gradually lessens until the normal appearance of the skin is restored, without pigmentation or scars. The nummular and annular forms occasionally, from various causes, especially traumatism, become the seat of inflammation, furnish a discharge, and closely simulate eczema. This condition is known as inflamed psoriasis. The affection may also display a bright-red color, and is by some writers called *scarlatiniform* psoriasis. This name is, however, more properly applied to cases of subacute psoriasis, or severe exacerbations of the chronic disease, in which, spontaneously or otherwise, the skin is swollen, of a bright-red color, and partly covered with large, thin scales. At the same time fever may be present and the general condition of the patient be bad. The patches are occasionally considerably elevated above the general surface of the integument.

Psoriasis may attack any portion of the body, but may for a long time be limited to the elbows and knees.

After these sites, it next most frequently affects the head, the red or scaly rings extending somewhat beyond the hair to the forehead, ears, and neck, producing more or less disfigurement. When the eruption develops on the scalp, the hairs are usually not involved; they seldom fall out, and they retain their normal lustre and color. While the eruption may pass down to the forehead, neck, and ears, and the hearing occasionally become impaired by the scales blocking up the auditory canal, yet the face is rarely affected in its entirety. The disease may appear upon the prepuce and glans penis in the form of small red spots, covered with scales that are slightly adherent and are often soft. The coexistence of typical patches upon other portions of the body serves to point the diagnosis between this condition and the lesions of secondary syphilis.

Psoriasis seldom involves the palmar and plantar surfaces, but will in some cases attack the nails, making them thick, brittle and crumbling at the free edge. When the disease, however, invades the palms and soles it is peculiarly obstinate. The form of psoriasis that affects the nails was first described by Biett, and generally coexists with the disease in other portions of the body. Upon the first appearance of the disease, while the nail remains transparent, a spot of psoriasis may at times be observed beneath it.

In many instances, this elementary development may escape observation, the morbid action having already involved the matrices of the nails, giving the nails a thickened, rough, yellowish, or brownish appearance. They lack their peculiar lustre, are brittle and fissured, and do not extend quite to the ends of the fingers. Little pits are scattered upon the surface, giving rise to a wormeaten appearance, and the nails may finally fall off.

Psoriasis as a rule will not develop on the vermilion border of the lips nor on the mucous membranes. Hebra, in all his large experience, never observed a single case in which any organ other than the skin could with certainty be said to be involved.[1] Psoriasis is especially a chronic, non-contagious disease, which is usually attended with itching in its early development, at the time of its relapses, and upon the appearance of new spots. The itching may be severe, but gradually subsides with extension of the spots, and is often absent. I have noticed a subjective symptom, not usually described, in some cases of psoriasis; in those in which the larger portion of the skin was involved patients complained of a tight, tense feeling of the surface, and could predict a fresh outbreak by a preceding flushing of the skin.

The scales in some cases are very abundant, and may be firmly attached to the patches, or, as is more common, especially if the disease is extensive and has been of long duration, are shed in large quantities in the bedclothes or on the patient's clothing. Patches that have many firmly adherent scales have a dirty-white appearance, while those that are sparsely covered present a red tint. In some inveterate cases in which the scales have almost entirely fallen off, the patches are deep red, angry in appearance, attended with heat, burning and pain on motion, become fissured, and are hard, rough, and uneven to the touch.

The eruption, however, is always dry from the beginning to the end, and is never attended with any other lesion, except those that have already been noted. It may be, and is, at times, associated or complicated with other affections, both internal and external. Kriebeln refers to a pricking sensation in the tips of the fingers and toes, and Hebra has said that neuralgia, especially sciatic; is a frequent complication. A case in which the distinctive lesions of psoriasis and purpura rheumatica were combined has fallen under the observation of Dr. John A. Fordyce, of New York. Gaucher has described several cases in which the suppression of psoriasis was followed by severe constitutional disorder, as endocarditis with cerebral complications, organic disease of stomach and bowels, and asthma.

**Diagnosis.**—An eruption presenting the course and system just described could not possibly be due to any other affection. The diseases which most resemble it are eczema squamosum, syphilis, seborrhea, lupus erythematosus, ichthyosis, lichen ruber, pityriasis rubra, and tinea capitis.

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[1] Leukoplakia, a chronic, hyperplastic affection of mucous membrane, principally of the tongue, is a distinct disease from psoriasis.

Eczema squamosum, while differing very much from psoriasis, is frequently mistaken for it.

In psoriasis the most prominent lesion is the mass of epidermic cells. The sensation of itching, which is usually slight, is present only when the patches first appear; the scales are silvery, thick, and are seated on dark-red patches involving by preference the extensor surfaces.

In *eczema* the primary lesion is usually the erythematous patch or the vesicles, pustules, crusts, or moist spots; the subjective symptom of paresthesia or pain is greater, and usually lasts during the entire course of the disease; the scales are not silvery, but are thin crusts loosely situated on bright-red patches, manifesting a preference for the flexor rather than the extensor surfaces.

The course of the two affections can thus be seen, from the dry, uniform eruption in psoriasis, and the polymorphous lesions in eczema, to be dissimilar in every way. Again, psoriasis of the head may be distinguished from eczema by the patches being discrete, with intervening healthy skin, and covered with scales that are thicker, darker, and drier than those of eczema. Psoriasis spreads in segments over the forehead, the neck, and ears, and rarely moves beyond these limits and is slow in its course. Eczema passes rapidly from the scalp to the forehead, neck, and ears, and will often invade the entire face.

Further, the patches of psoriasis are always clearly outlined and show a tendency to heal in their centre, while those of eczema fade away into the healthy skin, and have no inclination to repair in the middle of the spots of infiltration.

The adherent scales, situated on red spots over the forehead, arms, and limbs, separated by tracts of healthy skin, in a limited *syphilitic eruption* may be mistaken by the casual observer for psoriasis. A more careful examination of the scales will show that they are of a dirty color, and that the red spots on which they rest pass beyond them; in psoriasis the scales are silvery or whitish in color and generally extend beyond the red bases which they cover. The preceding symptoms of lassitude, backache, headache, furred tongue, sore throat, and all the symptoms of syphilitic fever, with their entire disappearance upon the breaking out of the eruption, will be additional evidence of a syphilide. A scaly eruption may be present in the palms of the hands and soles of the feet, regions often attacked by syphilis, but rarely affected with true psoriasis. In cases of long standing, the appearance of crusts, mingled with scales, spots in the process of fading having a coppery hue, mucous patches, scars, or the enlarged lymphatic glands, particularly the post-cervical and epitrochlear, and lesions on mucous surfaces, will always stamp the case as syphilitic. Professor Neumann[1] describes two cases in which psoriasis coexisted with a syphilitic eruption. Appropriate treatment caused the latter lesions to disappear, but had no effect upon the psoriatic patches.

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[1] Wiener Medicinische Wochenschrift, No. 7, 1890.

*Seborrhea sicca* may resemble psoriasis of the scalp. The patches of the former will be found to be crusts composed of sebaceous material, fatty and greasy to the touch, upon removal leaving a pallid surface, and not a reddened, bleeding base as in psoriasis.

In seborrhea the scales consist of dried sebum, while in psoriasis they are composed of epidermic cells. Psoriasis may develop on any part of the body, and when it involves the scalp, may pass down on the forehead. Seborrhea, on the contrary, is generally confined to the scalp, the eruption forming only a scurfy mass just beyond the margin of the hair. The hair in seborrhea often loses its lustre and falls out in large quantities, while in psoriasis no loss or change whatever takes place. There are some instances of the concurrence of seborrhea or seborrheic eczema with psoriasis.

*Lupus erythematosus* is usually confined to the face, while psoriasis is seldom seen in that situation alone. The lupous spots are covered with thin, scanty, firmly adherent, dry, or greasy white or yellowish-brown scabs and crusts, upon the removal of which the ducts of the follicles to which they were attached appear plugged with comedones; the scales of psoriasis are abundant, always dry, white or silvery, fall off, or are easily removed, and rest upon reddened patches.

Lupus as a rule is a disease of adult age, and is attended with pain and tissue-destruction, with the formation of scars; psoriasis occurs during all ages, and is not accompanied by pain or scarring.

*Ichthyosis* is a congenital disease, developing during or after infancy; psoriasis usually appears at a later age. Ichthyosis is unattended with any evidence of irritation or inflammation, the skin is mapped out in spaces, harsh, rough, dry, with fine, brownish scales, while in psoriasis the inflammatory patches are separated by perfectly healthy skin, and the spots are covered with whitish, silvery scales.

*Lichen ruber planus* occurs much less frequently than psoriasis, and its lesions are characteristic and distinct. Lichen ruber is attended with great constitutional disturbance, while psoriasis is not accompanied with any impairment of health. The papules in lichen ruber are covered with scanty yellow scales, unlike the whitish ones of psoriasis.

*Pityriasis rubra* attacks the unhealthy, psoriasis the apparently healthy. The scales do not accumulate as in psoriasis and fall off, but exfoliate in large flakes, leaving the skin beneath red and tender.

*Pityriasis rosea* (*p. maculata et circinata*) could scarcely be mistaken for psoriasis, as there is no infiltration of the skin, and the lesions do not begin as small papules.

*Tinea capitis* will give rise to a scaly con [illegible] es be mistaken for psoriasis, but the hairs are [illegible] off; the scales are scanty, except where the parasite is most active, around the margin of the patch. In psoriasis the hairs are usually normal, and the scales abundant over the entire diseased area. The history of the case, its limitation generally to one patch, and the occurrence of vesicles and pustules around the periphery, should lead to a microscopical examination for the parasite, the discovery of which will remove all doubt.

**Pathology.**—The pathological anatomy of psoriasis has been carefully studied by many investigators. Hebra examined the skin of persons affected with psoriasis, who had died from intercurrent disease, and reported that no abnormal condition could be detected, either with or without the microscope, upon structures that were the seat of the disease during life. He therefore limited himself to the morbid products as they appeared on the living body to the naked eye, as heaps of scales made up of epidermic cells situated on a hyperemic skin.

Wertheim, after excising and examining portions of the skin of psoriasis patients, found constant enlargement of the papillæ of the skin, and conjectured that their vessels were also enlarged.

Auspitz[1] was perhaps one of the first to call attention to the action of the cells of the rete Malpighii in an article on the relation of the epidermis to the papillary layer. Neumann found the epidermal cells and the rete Malpighii greatly developed, the papillæ considerably enlarged, especially in chronic cases, the corium and papillæ also filled with cells. From these observations he concludes that psoriasis is a disease of the most superficial strata of the corium and papillary layer, accompanied with cell proliferation, in which disease the papillæ appear considerably enlarged. Further, that "the excessive formation of scales is only a hyperplasia of the cells of the rete Malpighii, accompanied by increased desquamation of the epidermis." Luciani has found in the cutis numerous leucocytes in a condition of karyokinesis. He concludes, therefore, that the epidermis and the cutis vera are affected at the same time.

Tilbury Fox, reasoning upon both his own and Neumann's observations, added later that he "was constrained to believe that the disease consists primarily and essentially in a misbehavior of the cell-elements themselves, a perversion of the ordinary cell-life of the epidermis."

The pathology of psoriasis has also been studied by Thin,[2] Jameson,[3] and Robinson.[4] According to the latter, the disease consists essentially of a hyperplasia of the normal constituents of the rete Malpighii. The increase occurs principally in the interpapillary portion of the layer, which, growing downward, gives the papillæ of the corium the appearance of increased size, which is not found to be increased upon a closer examination.

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[1] Archiv für Derm. und Syph., Erstes Heft, 1870.

[2] British Medical Journal, September 4, 1880.

[3] Edinburgh Medical Journal, January, 1879.

[4] New York Medical Journal, July, 1878.

The superficial blood-vessels of the corium, in the more advanced form of the disease, become dilated, the white corpuscles migrate, and the blood-vessels and the connective tissue of the corium become the seat of round cell-infiltration which, with the effused serum, divides the connective tissue into open meshes. The sebaceous and sudoriparous glands are not at any time involved, but there is hyperplasia of the external root of the hair, extending into the cutis, which corresponds to the Malpighian layer of the epidermis. Unna has described more particularly the condition of the blood-vessels in the papillæ. He states that "there follows, on a moderate general dilatation of the vessels in the psoriasis papule, an excessive dilatation of the venous roots of the descending limb of the papillary capillaries; and further, there is added at the papillary loop a quite unusual lengthening of the vessel for a short distance."

**Etiology.**—Psoriasis may depend upon hereditary or acquired disease. It may follow any derangement which interferes with the nutrition of the skin. Thus it is known to arise frequently from rheumatism and gout.[1] James Burnell, of England, makes the observation[2] that "Psoriasis rarely occurs, in children at least, save in rheumatic subjects, and that it is a rheumatic manifestation is supported by the benefit which may result from anti-rheumatic remedies." Garrod, however, denies that gout is concerned in the causation of psoriasis, and believes that the association is accidental. It is noticed at times to follow eczema, scrofula, syphilis, and other affections which produce an impoverished condition of the blood. Psoriasis occasionally develops after an attack of scarlet fever. It is sometimes associated with diabetes mellitus. Pregnancy and lactation not infrequently aggravate the disease. It may also have a nervous origin, arising, as Weyl said, "from a functional weakness of the nervous centre regulating the nutrition of the system." The disease, in some cases, has a unilateral distribution and has even followed the course of certain nerves. It is accompanied by vasomotor disturbance, which is the direct cause of the development of the papules. In certain cases a relationship seems to exist between asthma and psoriasis. Neuralgia and paresthesia occur as complications in rare instances. Psoriasis not uncommonly develops in subjects of chronic alcoholism. Wilson viewed psoriasis as a manifestation of the syphilitic poison after transmission through one or more generations. Lang, on the other hand, believed it to be due to a fungus which he claimed to have discovered, and named epidermidophyton. Destot reports having inoculated himself with psoriasis by inserting into his shoulders scales taken from a child. Sixteen days later patches of psoriasis appeared on both his elbows. Unna has known a nurse to communicate the disease to three children under her charge. The theory of the parasitic origin of psoriasis is generally accepted;

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[1] See paper by author on "The Cause and Treatment of Psoriasis." The Medical Bulletin, December, 1888.

[2] British Journal of Children's Diseases, Sept., 1904.

however, some cases appear to be of purely nervous origin. Psoriasis occurs in the apparently robust as well as those who are weak and poorly nourished. It is at times apparently the result of mechanical or chemical irritation, as from pricking the integument in vaccination or pressure of clothes and bands, cupping, leeching, blisters, wounds, and injuries. Psoriasis, in the opinion of the writer, follows the action of local irritants only in those predisposed to the disease by some constitutional condition. The affection may appear at any period of life, but is more commonly encountered at the age of puberty. The disease is more common in men. It has been known to appear in consequence of acute emotion. The influence of heredity is observed in many cases.

**Treatment.**—The treatment of psoriasis is usually unsatisfactory. In order either to relieve or eradicate the disease, months of careful attention to hygienic means, as well as internal and external medication, will often be required. The hygienic measures of most importance are exercise, massage, and bathing. A case has been reported of a boy who in the spring time was seen to be covered with patches of psoriasis, and at the end of the summer as the result of taking a daily swim in the river, and exposing the skin to the air and sunlight, became entirely cured, without any medical treatment. As a matter of observation psoriasis is generally better in summer than in winter. Some patients can free themselves from the disorder, by simply giving the affected areas a sun-bath daily (Hyde and Montgomery). The diet, especially in recent cases, should contain a less proportion of nitrogenous food. All highly spiced and rich gravies should be forbidden. Coffee, tea, alcohol and tobacco are also objectionable.

The functional activity of the skin, alimentary canal, and kidneys, should be increased, so that the blood may be depurated and oxidation promoted. The skin may be rendered more active by exposure to the fresh air and sunlight, or to the x-rays; also by exercise, massage, and baths, or administration of diaphoretics, such as antimony, ipecacuanha, pilocarpus, or pilocarpin. The alimentary canal may be stimulated by the natural mineral waters, especially Friedrichshall, Congress, or Bedford. Epsom or Rochelle salts, senna, rhubarb, rhamnus purshiana, podophyllin, or one of the mercurials, will answer the same purpose. The activity of the kidneys may be increased by colchicum, digitalis, copaiba, potassium acetate, lithium carbonate, and other diuretics. In the majority of recent cases, and in some of the more chronic, I usually begin with the hygienic measures just suggested, with an occasional diaphoretic, diuretic, and cathartic. When the disease is dependent upon a rheumatic diathesis the most efficacious remedies are salicin, quinine, salicylic acid, the salicylates, salol, oil of wintergreen, iodide of potassium, antipyrin, acetanilid, and acetphenetidin (phenacetin). In gouty subjects, besides those drugs which have been mentioned, guaiacum and alkaline waters are of benefit. Dr. H. Radcliffe Crocker has observed marked improvement follow the use of sodium salicylate, salicin, or salophen in cases not apparently dependent upon rheumatism. The cases to which he finds these remedies best adapted are those in the period of active development and attended by hyperemia. No favorable influence upon the disease resulted if the preparations excited digestive disorder. The preparations of iron, diluted phosphoric acid, codliver and chaulmoogra oils, fluid extract of berberis aquifolium, and preparations of antimony and turpentine are at times found serviceable. Hura brasiliensis, rhus radicans, daphne mezereum, hydrocotyle Asiatica, gurjun balsam, manganese, barium chloride, phenol, tar, tincture of cantharides, and sulphydrate of zinc have also been made use of with reported good results. When distinctly of nervous origin, the oxide of zinc, nitrate of silver, chloride of gold and sodium, and the galvanic current are of service. The bromides and preparations containing valerian are also advantageous in such cases. Nervous patients should be warned to avoid tobacco, coffee, and all forms of excitement. A remedy brought forward by Dr. Napier is chrysarobin, from which he reports good results, given in one-half-grain (0.03 gm.) dose, combined with sugar of milk, and the dose increased to the limits of toleration. After giving this remedy in a number of cases and having observed no decided effect from it, I am inclined to believe that it acts simply as a purgative. Evidently the dose is too large; better results might be obtained by smaller quantities continued for a long time. Salines, especially the natural spring waters and other purgatives, have been highly extolled at different times, and chrysarobin acts in a similar manner by producing free elimination from the intestinal canal.

The eruption becomes pale under its use and disappears, but again reappears upon discontinuing the drug. It would be unwise to purge a patient continually to keep the disease in abeyance. Burdock-seed, made in the form of a tincture with whisky, has also been lauded as a specific for the eruption. Unfortunately, I must say that it too, after a fair trial, has proved utterly valueless in my practice in psoriasis. In the majority of cases, however, notwithstanding all treatment, the disease will continue and gradually become chronic. In the latter stage of the disease almost every known drug has been vaunted at some time or another as possessing a specific action. They have all been tried, by the alimentary canal and by the epidermic and hypodermic methods, with decided benefit from only arsenic, sulphur, and iodide of potassium. I regard arsenic as one of the most efficient of all internal remedies, after the first stage of the disease has passed. The administration of arsenic must, however, be accompanied by a careful observation of hygienic rules, and the activity of the secretions should be sedulously maintained. The preparations of arsenic which I employ are the trioxide, the arsenate of sodium (Pearson's solution), and the solution of arsenite of potassium (Fowler's solution). Arsenic trioxide, or the arsenate of sodium, is to be preferred to the solutions of arsenic, for the reasons stated in the chapter on "Treatment." The solutions of arsenic, if given, should be employed first in minimum doses and gradually increased. From one to twenty drops of either the solution of arsenite of potassium, or of arsenate of sodium, can be administered. The average dose of either is from five to ten drops three times a day. Trioxide of arsenic, or arsenate of sodium may be given in from one-fortieth to one-tenth of a grain (0.0015 to 0.006 gm.) in pill-form. I have in some cases administered them in combination with other drugs with a very happy effect, as in the following prescriptions:

| | | | |
|---|---|---|---|
| ℞ | Arsenii trioxidi | gr. j. | 0.06 |
| | Quininæ sulphatis | gr. xl. | 2.60 |

M. Ft. pil. no. xx. Sig.: One pill after meals.

| | | | |
|---|---|---|---|
| ℞ | Sodii arseniatis | gr. j. | 0.06 |
| | Extracti hyoscyami | gr. v. | 0.30 |
| | Extracti gentianæ | gr. xx. | 1.30 |

M. Ft. pil. no. xx. Sig.: One pill after meals.

Occasionally the value of arsenic is much enhanced by giving both quinine and strychnine with it, as in the following combination:

| | | | |
|---|---|---|---|
| ℞ | Quininæ sulphatis | gr. xxx. | 2. |
| | Arsenii trioxidi | gr. j. | 0.06 |
| | Strychninæ sulphatis | gr. ss. | 0.03 |
| | Aloini | gr. j. | 0.06 |
| | Extracti belladonnæ foliorum | gr. iij. | 0.18 |

M. Ft. pil. no. xl. Sig.: One pill after meals.

The hypodermic administration of arsenic trioxide, or, even better, arsenate of sodium, often acts most decidedly in lessening or in entirely removing the eruption, after the remedy has failed to accomplish the least good by the stomach. I use for this purpose the arsenate of sodium, beginning with one tenth of a grain (0.006 gm.), dissolved in water, and injected daily into the deep cellular tissue of the back, arms, or buttocks. The dose is gradually increased until the patient can tolerate one-half-grain (0.03 gm.) doses, given twice a week, or daily, in this way.

The dose of arsenic, whether given by the above method or by the stomach, should be gradually increased until some effect is produced. The evidence of its action will be in the lessening of the scales and redness of the patches, which slowly acquire a brown tinge and finally entirely disappear. It will often be necessary to give the remedy for a long period before this effect is observed, and to continue administering it for some time after the eruption has disappeared. While arsenic is no doubt effective, it is by no means a specific, and under its use new spots may crop out, and in some instances relapses occur. Notwithstanding the occurrence of relapses, the persistent use of the remedy will, in many cases, eventually eradicate the disease. In others, however, the disease will remain or undergo relapses, even though the physician may give the arsenic as recommended and exercise the best skill in managing the affection. All that can be hoped for in such cases is that the eruption may be kept in abeyance, and the disfigurement of the body averted. Sulphur, in some cases, has a marked action in relieving and curing the affection. It acts upon the skin, the mucous membrane, the glands, especially the liver, and thus assists in overcoming the infiltration or patches of the disease. The author has employed from five to ten grains (0.30 to 0.60 gm.) of precipitated sulphur, given in the form of a powder, lozenge, or capsule, three or four times a day, with sometimes curative effect. Attention was called by Dr. Greve, of Norway, to the iodide of potassium in massive doses as a remedy in psoriasis. His statements were confirmed by Dr. C. Boeck, of Christiana. Encouraged by their results, Dr. Haslund, of Copenhagen, adopted the treatment in a series of cases. His experience[1] shows that in the majority of persons this drug may be administered in very large doses without ill effects. In forty cases the disease was entirely cured, in four there was considerable improvement, while in six cases no benefit resulted. In six of the cases cured the average duration of treatment was from seventeen to twenty-five days, in the remainder the average was slightly over seven weeks. In the six cases so rapidly cured, the eruption was chronic and almost universal. In some patients improvement began when a daily dose of seven to eight grammes (one hundred and eight to one hundred and twenty-three grains), in others when ten grammes (one hundred and fifty-four grains) were taken. In most cases even larger doses were required; in a number thirty to forty grammes (four hundred and sixty-three to six hundred and seventeen grains) and in one patient as high as fifty grammes a day (seven hundred and seventy-two grains) were given. In most of the cases no signs of iodism appeared. In three instances the blood was examined during treatment. The corpuscles were unaffected in number, size, or form. In four cases the urine was systematically examined. No effect was produced upon the elimination of urea. Neither was any wasting of fatty or glandular tissue observed. The same method of treatment has been tested by Dr. Barduzzi and Dr. Paolo Luciani with encouraging results. Gutteling experimented with large doses of iodide of potassium in twenty-two cases, giving an average daily dose of one hundred and fifty to three hundred grains. In five patients he was obliged to discontinue the remedy. In several after a certain improvement had been made the disease remained stationary, while in five complete recovery ensued. Dr. M. P. Vander Horck, of Minneapolis, has reported[2] ten cases of psoriasis, of which eight were entirely cured by the iodide of potassium and two were improved. In three instances relapse occurred. In one albuminuria developed. In the light of this experience it seems that heroic doses of iodide of potassium are tolerably well borne and rarely give rise to serious consequences, that they undoubtedly exert a beneficial effect in many persons suffering with psoriasis and should usually be resorted to in those cases which are not improved by arsenic.

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[1] British Medical Journal, January 7, 1888.

[2] Northwestern Lancet, April 1, 1890.

In my own experience the iodide has been particularly serviceable in rheumatic and gouty cases, and it is probably to the existence of these conditions of the system that the remedy owes, in most patients, its efficacy. As regards the prolonged use of large doses of the iodide, M. Féré has demonstrated[1] in the case of the bromides the advantage of maintaining intestinal antisepsis by means of naphthol and salicylate of bismuth, and this practice is probably equally valuable when the iodides are being administered. Small doses of belladonna or of arsenate of sodium have also been combined with the iodide in order to prevent the occurrence of iodism. In view of the probable parasitic and infectious origin of psoriasis, Dr. E. D. Mapother advocates[2] a mercurial therapy. His usual method is to give three grains (0.18 gm.) of blue mass every night for about eight weeks, and generally finds that the eruption is removed in six weeks. The green iodide may be employed in preference, or Donovan's solution, which is efficacious both by means of the mercury and arsenic which it contains.

The frequent administration of small doses of antimony has been found to have a beneficial influence upon the diseased skin. The fluid extract of cascara amarga, given in doses of half a drachm to a drachm several times daily, has been thought to aid in ameliorating the manifestations. Fucus vesiculosus has been used with some success. Favorable results have been reported from the internal employment of gurjun oil. In several cases I have obtained excellent results from the hypodermic injection of corrosive sublimate, in the dose and manner described in the chapter on "Syphilis." The injections were followed by a complete disappearance of the eruption. I can also speak favorably of the action of the iodosulphate of cinchonine, in doses of one to five grains (0.06 to 0.30 gm.) three or four times a day. A number of cases of obstinate psoriasis have been reported in which thyroid feeding or the use of tablets of thyroid extract was productive of benefit. This method has been tested by the author and a number of other observers in this and foreign countries. Although in certain cases undoubtedly good results have been obtained, yet in others the remedy has either relatively or absolutely failed. In some instances the treatment aggravated the cutaneous disease. It has been known also to produce undesirable constitutional symptoms. It is impossible to formulate any positive judgment as to the class of cases likely to be benefited by thyroid therapy. In inveterate cases, where other remedies have proved useless, recourse may be had to this method with some hope of advantage. Thyroid extract is not a specific in psoriasis; but it occasionally is useful in a very rebellious case.

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[1] La Tribune Médicale, February 5, 1891; Medical Bulletin, April, 1891.

[2] British Medical Journal, January 17, 1891.

**Local Treatment.**—Local remedies are of great assistance. It is necessary, however, to macerate and remove the epidermic scales, and expose the hyperemic skin beneath. This may be accomplished by a warm, hot, or medicated bath, by packings and friction, by rubbing well into the patches lard, olive or codliver oil, which should be allowed to remain for a time, after which it should be washed off with a simple or medicated soap, in a warm or hot bath. Soap used in this manner, containing betanaphthol, tar, or phenol, frequently assists in softening the epidermic cells. The greatest difficulty the physician experiences is in making the patients fully comprehend the importance of remaining in the bath until the scales become thoroughly macerated so that they can be afterwards easily removed. If the patches are not extensive, the scales may be removed by poultices, oil or water, applied with cotton, lint, or bandages. They can also be taken away by producing active diaphoresis, covering the affected surface with oiled silk and rubber tissue, or, even better, by waxed or oiled paper. The latter application, which I use entirely in hospital practice, is a cheap, convenient, and easy means of promoting elimination from the surface, and is within the reach of almost every individual. In some subjects, copious draughts of water, with plenty of exercise and long immersion in warm or hot baths, will be sufficient to render the skin active and macerate and remove the scales. In others, particularly the very busy, one or more patches may be selected and covered with oil packing, while engaged in reading, writing, or some quiet social enjoyment. Thus, night after night, scales may be softened and removed from the various patches.

The mineral waters and baths of certain resorts, both in this country and in Europe, have gained at times a reputation for curing this affection. Their successful use in some instances is due to the low diet, a long walk to and from the spring, with copious and frequent draughts of the water, all of which promote profuse diaphoresis, followed by exfoliation of the scales, together with a lessening of the infiltration, aided, even more, by frequent and long-continued bathing.

The scales can also be removed by friction with sand, as suggested by Ellinger, or with green soap, as recommended by Hebra and Kaposi. The soap is to be well rubbed in each patch with a piece of flannel, until the blood is seen to ooze from the base, the same operation being repeated for six or eight consecutive days. During this period the patient is kept lying in a blanket impregnated with soap. Under this process, the patches assume a brownish color, and in three or four days afterward, while yet in the blanket, the bed or body linen not being changed, extensive desquamation takes place, the whole cuticle peeling off in large lamellæ. A general bath which follows thoroughly cleanses the surface. The green soap is frequently applied, without using the blanket or rubbing in the soap, in the manner described. It may be applied with the aid of water, or in the form of liniment of green soap. I have, upon a number of occasions, thoroughly tested this method. It is effective in cleansing the patches, but the pain is so intense that I depend entirely upon the means I have advised, as being sufficient to bring about the same result, without suffering. The milder methods of treatment I believe to be the most efficacious, particularly with Americans.

In France, it is customary to remove the scales by means of the alternate use of starch and vapor baths. During the night caoutchouc is applied, not, however, to the whole body. If the treatment by baths is impracticable, the following ointment is recommended as being painless and effective:

| | | | | |
|---|---|---|---|---|
| ℞ | Ammonii carbonatis | 10 | grammes. | |
| | Adipis lanæ hyd. | 25 | " | |
| | Ungt. aquæ rosæ | 50 | " | M. |

A plaster, containing salicylic acid, will also facilitate the removal of the scales, or a two-per-cent. solution of salicylic acid in castor oil may be used as advised by Dr. G. H. Fox.

After the patches have been freed from scales, the next step is to apply a remedy which will have a curative action upon the vascular integument. Among the preparations used for this purpose are tar, phenol (carbolic acid), creosote, naphthalin, and betanaphthol; also thymol, turpentine, Vleminckx's solution of sulphuret of calcium, Rochard's and Wilkinson's ointments, the mercurials in ointment form, pyrogallic acid, anthrarobin, chrysarobin, or chrysophanic acid, hydroxylamine, iodoform, iodol, thymol iodide, and europhen. Tar can be used either as pix liquida, oleum fagi, ol. cadini, ol. rusci, and ol. ligni fossilis empyreumaticum. These preparations may be incorporated with lard, suet, wool-fat, or one of the ordinary ointments, in the proportion of one to four drachms (4 to 16 gm.) to the ounce (32 gm.). They may also be combined with soda or potash soap, glycerin, various oils, as olive and codliver oils, alcohol, and the liniment of green soap. Wilkinson's ointment, as modified by Hebra, is composed as follows:

| | | | |
|---|---|---|---|
| ℞ | Sulphur sublimati, | | |
| | Ol. cadini | āā ℥ss. | 16. |
| | Saponis mollis, | | |
| | Adipis | āā ℥j. | 32. |
| | Cretæ preparatæ | ʒijss. | 10. |

M. Ft. ung.

Another mixture proposed by Hebra, consisting of equal parts of pix liquida, alcohol, and sapo mollis, has been tried and highly recommended.

Anderson's tinctura saponis viridis cum pice, Guyot's solution of tar, Bulkley's liquor picis alkalinus, and the liquor picis carbonis (P. Br.) are useful and effective applications. All tarry preparations, however, are decidedly objectionable, especially in private practice, by reason of their disagreeable smell, the dark color that they impart to the skin, and the unpleasant and even toxic effects which sometimes result from their local use. The penetrating odor and darkening of the skin, as well as the clothes, are so great that it is often out of the question to prevail upon some patients to continue the treatment. Patients will state that they can usually hide the disease, but the disagreeable odor of the tar attracts universal attention. Further, the local application of tar is occasionally followed by an increase of temperature of the parts, with swelling, tension, pain, redness, papules, vesicles, and every symptom of dermatitis, or folliculitis. Small furuncles may be developed. Again, tar may be well borne at first; but headaches, fever, nausea, dark-colored urine and blackened feces, and other unpleasant evidences of its absorption into the circulation, develop, and compel suspension of the use of the drug. Phenol and creosote, while neither so active nor effective as tar, have been successfully used both in the form of lotions and ointments. Naphthalin, a white, crystallizable product of tar, at times used as a substitute for the latter, possesses, it is claimed by some, all its advantages, and is devoid of its black color and disagreeable smell. Betanaphthol, another product obtained by distillation of tar, and introduced to the profession by Kaposi, is a gray, granular substance, very pungent, which can be combined with either alcohol or simple ointment in the proportion of one or more drachms (4 gm.) to the ounce. The odor of betanaphthol is especially acceptable; it will not stain, and its local action is equally as effective as tar. Thymol, being a colorless preparation without a disagreeable odor, has been suggested as a substitute for tar by Crocker, in the strength of from five to thirty grains (0.30 to 2. gm.) to the ounce of ordinary ointment. Turpentine, alone or mixed with olive oil, can be applied with good result; care, however, must be exercised in using it to avoid strangury. The solution of sulphuret of calcium, first used by Vleminckx, of the Belgian army medical service, has been found useful. The formula is also known as liquor calcis sulphuratæ (N. F.):

| | | |
|---|---|---|
| ℞ Calcis | ℥ss. | 16. |
| Sulphuris sublimati | ℥j. | 32. |
| Aquæ | f℥x. | 320. |

M. Coque ad ℥vj, deinde filtra.

This compound is a dark orange-yellow fluid, and is slightly caustic. It should be kept in small well-filled bottles. It should be freely rubbed into each patch with a piece of flannel until the surface bleeds, then reapplied and allowed to dry, after which a warm bath is given in which the subject is allowed to remain about an hour, followed by washing the surface again with either cold or warm water. After this procedure, the surface is anointed with some bland ointment. Ichthyol has likewise been employed. Barduzzi makes use of a ten-per-cent. preparation of sulphydrate of zinc. Creolin is another recently introduced substance which has been found advantageous in psoriasis. It is applied in the form of a twenty-per-cent. ointment. Rochard's ointment is also an effective application with the following formula:

| | | |
|---|---|---|
| ℞ Iodi. | gr. xl. | 2.60 |
| Hydrargyri chloridi mitis | ʒss. | 2. |
| Ungt. simp. | ℥j ʒvj. | 56. |

M. Ft. ung.

It should be applied to the patches, once or twice daily, until vesicles are formed.

Although Vleminckx's solution and Rochard's ointment are efficacious, especially in inveterate cases, nevertheless the intense suffering which they produce makes them more objectionable than the green soap and sand methods of Ellinger, Hebra, and Kaposi. In cases presenting obstinate patches, the dermal curette can be used in conjunction with the remedies already mentioned. Acetic acid and cantharidal solutions have also been suggested, but the mercurial ointments have, in my experience, yielded the best results. The ammoniated, biniodide, and protiodide can be prescribed in from two grains to the drachm (0.12 to 4 gm.) to the ounce (32 gm.) of lard or simple ointment, with decided advantage. Great care, however, should always be exercised in using the biniodide, as in large quantity it may cause severe irritation of the skin. The nitrate and oleate of mercury are the best and most effective of the other mercurials. I usually dilute the officinal ointment of the nitrate, or oleate, of mercury with one-half or two-thirds of lard, and add to it, in private practice, a half to a drachm (2 to 4 gm.) of either betanaphthol or chrysarobin. In hospital service, I generally order the nitrate of mercury ointment in conjunction with the ordinary tar ointment. When one or more patches are selected to be treated with any of the mercurials at one time, if care be taken not to cover too much surface, no constitutional effects should be experienced. Mapother relies upon some form of mercurial ointment in connection with the internal administration of mercury. In psoriasis of the head and face, mild applications are preferable, such as calomel, or ammoniated mercury ointment (5 to 20 per cent.). Chrysarobin should not be used upon the face, head or neck, as it may set up dermatitis, or the fingers may carry it into the eyes and cause a painful conjunctivitis.

Among many of the valuable local remedies in the treatment of psoriasis are chrysarobin and pyrogallic acid. Chrysarobin was first introduced to the profession by Balmanno Squire,[1] and has been highly commended. It should be incorporated in lard while hot, with the addition of a little benzole to increase its solubility. Chrysarobin can be prescribed in the strength of from fifteen grains to two drachms (1 to 8 gm.) to the ounce (32 gm.) of lard. It is best to learn its special action on each individual by beginning with a weak ointment of about fifteen or twenty grains (1 to 1.30 gm.) to the ounce (32 gm.) and gradually increasing its strength. Chrysarobin should be handled with great care and applied, if possible, under the direction of one familiar with it. If an ointment of chrysarobin is given to those who can not comprehend the necessity of care in its employment, and who will daub it over the surface in an indiscriminate manner, general cutaneous irritation will follow. If applied judiciously and carefully, night and morning, the affected patches lose their scales and undue morbid thickness; they are transformed into a polished, smooth surface, which becomes white like the normal skin. The skin around the patches is stained a dullish-brown color, and slightly desquamates under the stimulus of the drug. Unless the parts are well covered with old muslin or a bandage, which I always insist upon, the linen will be stained a brownish yellow. The ointment should be well rubbed in, great care being exercised to prevent it from running off on the surrounding skin. Chrysarobin ointment should not, if possible, be brought in contact with the hair, which would be dyed a purplish color; neither should it touch the nails, which would also be stained. Patients should always be instructed not to put their hands near the eyes if they have handled the drug or the hands have been in contact with the diseased surface after the application. Fox, of New York, has suggested an excellent method of applying chrysarobin by making a paste with the addition of water to it, and smearing the paste upon the patches after the scales have been removed, allowing the mixture to harden, after which collodion is penciled over the surface. The drug is thus kept in contact with the diseased patches and is also prevented from involving the surrounding skin or staining the linen. Another plan, also suggested by him, is to dissolve the chrysarobin first in a little alcohol and ether, and then add the collodion. Chrysarobin may also be incorporated in soap, and employed very effectively upon the skin for the removal of the scales and infiltration. Even with the greatest care, in those who have a sensitive or irritable skin, chrysarobin will set up an intense dermatitis, characterized by heat, swelling, itching, and pain, or an erythematous and furuncular inflammation, attended with a brownish, prune-juice discoloration of the skin. It is even stated that violent systemic effects of the drug are at times developed by its local use. That chrysarobin is absorbed by the skin and can be detected in the urine, causing albuminuria during its application, has been demonstrated by

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[1] British Medical Journal, November, 1876. "The Treatment of Psoriasis by an Ointment of Chrysophanic Acid," London, 1878.

Israel (Virchow, Archiv IV). I believe, however, that any injurious effect which may supervene is largely due to a lack of judgment in its application. If the drug is used in an indiscriminate manner upon all subjects, whether children or adults, and without regard to the condition of the skin, whether sensitive or not, bad effects must necessarily follow this abuse of so powerful an agent. It may be combined with salicylic acid and collodion, as recommended by Wm. Bedford Brown, of New York:

| | | |
|---|---|---|
| ℞ Acid. salicylici ...................... | gr. xx. | 1.33 |
| Chrysarobin ......................... | ʒj. | 4. |
| Collodion ........................... | ℥j. | 32. |

M. This may be painted on the patch with a brush, once in twenty-four hours.

In limited spots of psoriasis, the most effective way of applying the drug upon the surface is in the form of chrysarobin plaster. The parts are protected, and inflammation rarely follows. Thymol iodide anthrarobin is an efficient substitute for chrysarobin, is productive of less irritation and staining, and is said to be devoid of toxicity. It is best used in the form of a ten-per-cent. ointment, which may be very well combined with the ointment of the nitrate, or, of oleate, of mercury. Thymol iodide and europhen are likewise excellent local applications, staining neither skin nor clothing, and are incapable of causing conjunctivitis. They may be made into ten-per-cent. ointments with purified wool-fat, oxide of zinc, or Goulard's cerate (Cerate of subacetate of lead, U. S. P.).

Pyrogallol, likewise a valuable remedy, was used for the first time in psoriasis by Järich.[1] It is less active than chrysarobin, painless, and will not give rise to inflammation of the surrounding skin, but will produce a brownish stain upon the surface, whether diseased or healthy, with which it comes in contact. This agent will stain the hair, nails, and linen, but not to the same extent as chrysarobin. It can be incorporated with lard, in the strength of from five grains (0.06 gm.) to two drachms (8 gm.) to the ounce (32. gm.). Pyrogallol may be advantageously employed dissolved in flexible collodion, half a drachm or a drachm (2 or 4 gm.) to the ounce (32 gm.), with the addition, if desired, of fifteen grains (1 gm.) of salicylic acid. Another method of using pyrogallol is to dissolve half a drachm (2 gm.) in an ounce of rectified spirit with fifteen minims of glycerin. As this agent will not produce the inflamation caused by chrysarobin, it is especially valuable in psoriasis of the head and face. Care should be exercised in using pyrogallol not to cover too much of the surface at any one time, as absorption may take place, giving rise to fever, strangury, methemoglobinuria, and black evacuations. Besnier reports four cases of poisoning from the external application of pyrogallol, two of which were fatal. The prominent symptom in all was hematuria or methemoglobinuria. A derivative of pyrogallol, termed gallacetophenon, has been proposed as a substitute, has given evidence of power, and may eventually be found of service. It is said to be much less toxic than pyrogallol and does not stain the linen. Gallacetophenon is a pale-yellow crystalline powder, soluble in hot water, alcohol, ether, and glycerin. The addition of acetate of sodium promotes its solubility in cold water. It has decided antiseptic properties. In the treatment of psoriasis it was used in the form of a ten-per-cent. ointment. Another new substance, which, according to the observation of certain authors, exerts a good local effect is gallanol, the anilide of gallic acid. Gallanol is used in the form of an ointment, in a strength varying from one to thirty to one to four of excipient, as a powder mixed with talc, and as a ten-per-cent. solution in alcohol or liquor gutta-percha. Gallanol occurs as colorless crystals, soluble in hot water, ether, and alcohol. Hydroxylamine hydrochloride has been used with success in psoriasis. It is decidedly irritant, and should not be applied, to begin with, in greater strength than one-tenth of one-per-cent., dissolved in equal parts of alcohol and glycerin. The proportion can be gradually increased and the application be made every day, or every second or third day, according to the effects produced. It will not stain the skin, but is capable of producing toxemia. Thymol iodide, on account of being free from the disadvantages just related, is a remedy decidedly to be preferred. An ointment containing this agent should be kept applied to the affected patches. Its action is less rapid than that of chrysarobin, without staining the skin, and, according to present experience, is absolutely without ill effects. Chrysarobin and pyrogallol have also been applied dissolved in chloroform, ether, flexible collodion, or solution of gutta-percha. If the patches are not too large, or numerous, this method of medication has the advantage of being cleanly. The agent is maintained in constant contact with the diseased area, but is apt to be painful and excite inflammation. Those drugs which have been found of service may also be used in the form of plasters. Chaulmoogra oil, made into an ointment in the strength of twenty to thirty grains (1.30 to 2 gm.) to the ounce (32 gm.), has proved beneficial in some cases. Gynocardic acid may be substituted for the oil for internal administration, dose gr. i or ij (0.06 to 0.13 gm.). Iodol, resorcin, and ichthyol ointments are good local applications. Myrtol is said to have been used with good effect.

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[1] Ann. de Derm. et de Syph., December, 1882.

The x-rays supply us with an efficient means of removing the lesions of psoriasis in many cases. Hyde and Montgomery reported that the lesions in seventy cases treated by this method were removed entirely in 35 cases (or fifty per cent.); nearly all removed in 18, and partially removed in 10; in 4 the subsequent results were not known; in 2 generalized cases the eruption partially disappeared but new lesions formed so rapidly that no progress was made. In one case, that of a neurotic woman in whom the lesions were of the ordinary nummular type, a long course of the treatment seemed to make no impression. "One case of inveterate psoriasis, which had resisted all forms of treatment for four years, yielded promptly to a few applications of x-rays and had not recurred at the end of a year. Treatments were given twice a week." The method is detailed as follows: "A coil is used with a spark gap equivalent of 8 inches, an ampèrage of from one to three, and a voltage of seventy. A moderately soft tube (usually the Müller automatic) showing a light so feeble that it could be detected with difficulty in ordinary daylight. The distance from target to lesion 8 to 15 inches, and the time of exposure 3 to 6 minutes. Treatments were given twice a week for ten days or two weeks and then suspended. From 3 to 6 treatments were required on the average to remove the lesions from a given area. After the second and occasionally after the first treatment, the subjective symptoms were ameliorated decidedly. Usually, within a week, the scaling was less pronounced and involution of the lesions progressed gradually, resulting in their complete disappearance in from three to six weeks. In the majority of the cases no reaction in the way of erythema or dermatitis was produced."[1]

**Prognosis.**—Psoriasis is very difficult to cure, especially when it is of long standing. Relapses vary in different individuals; thus it may recur after a month or months, or after a period of years. Psoriasis may disappear under appropriate treatment, to reappear within a few days, or it may be kept partially under control, the patient never being entirely free from some traces of the eruption. In some of the most inveterate cases, however, even where the whole surface is involved, the morbid changes in the skin have been at times completely and permanently removed by a long course of treatment. The mild form of the disease, particularly if seen upon its appearance, is more amenable to treatment. To sum up, I will state that, in my opinion, psoriasis is, as a rule, one of the most obstinate and unyielding inflammatory affections of the skin that the practitioner or expert in dermatology is called upon to treat.

PARAPSORIASIS.—In old syphilitic cases there is an eruption at times of a mixture of papules and maculæ which are generally attributed to the syphilitic infection, but are unaffected by mercurial treatment. According to Queyrat and Pautrier they may be regarded as cases of parapsoriasis. This is characterized by maculæ, or sometimes by papules, generally very superficial, of a rose or brown color, bleeding when rubbed, and which continue for years without itching, and which resist all treatment. In some cases a tubercular element has been suspected, and these have been classed as tuberculides. They may constitute a mixed infection, since they generally occur in patients with a syphilitic history, or may represent a transition stage between parapsoriasis and a tuberculoid lesion.

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[1] "Practical Treatise on Diseases of the Skin," Hyde & Montgomery, seventh edition, Philadelphia, 1904.

## VERRUCA.

SYNONYMS.—Verrue—Warze—Wart.

Verruca is a papillomatous growth, which is produced by the hypertrophy of one or more of the cutaneous papillæ, forming round, flat, pointed or irregular, soft or hard, circumscribed elevations, which are variable in shape and size.

**Symptoms.**—Warts may be congenital or acquired. They appear in many different forms, depending upon the situation and exciting cause. They may be sessile or pedunculated; round, flat, pointed, or irregular in appearance. Their surface may be smooth, or roughened and fissured. Warts vary in color, size, and consistence. They develop at all ages, but are more frequent in children and old persons. Their growth may be slow or rapid, persisting for years, or disappearing spontaneously after a short or long duration. Warts may be single or multiple. They appear upon all parts of the body, but are most commonly observed on the hands, face, scalp, neck, genitals, and feet. They sometimes occur under the fingernail. There are several varieties, which may be described as follows:

VERRUCA VULGARIS.—This is the ordinary variety. They occur most frequently on the hands, especially the fingers, but may also appear upon other regions. Plantar warts are common among young men, attending school or college. They are small, circumscribed growths, attached to the skin by a broad base, and are from a pin's-head to a pea in size. Their surface may be smooth, roughened, fissured, or lobulated. Their color is usually similar to that of the adjacent normal skin, but they may be grayish, yellowish, brownish, or blackish, these various shades being due to irritation or to dirt. This variety of warts may be soft, or firm, or even hard and horny, being insensitive, except when irritated; they then may become painful. They generally appear in crops or groups, but may be single.

VERRUCA PLANA (VERRUCA SENILIS).—Warts of this variety are flat, and generally round and broad, varying in size from a small pea to a five-cent piece, and are only slightly raised above the level of the skin. They are soft or greasy to the touch, smooth or slightly roughened, and grayish, yellowish, brownish, or blackish in color. They are usually met with on the back and face of elderly people, and may be either single or multiple.

VERRUCA DIGITATA.—This variety of wart is commonly met with on the scalp. It is also flat and broad, but is studded with fingerlike projections which give it a crab-like appearance. The digitated wart is more common upon the scalp of women than of men.

VERRUCA FILIFORMIS.—Filiform warts are commonly observed on the face, eyelids, and neck. They are small, fine, thread-like elevations, of about an eighth of an inch in length, existing, as a rule, separately, but occasionally occurring in groups.

VERRUCA ACUMINATA.—The venereal wart, or the pointed wart, moist wart, fig-wart, cauliflower excrescence, verruca elevata, spitzen condylom, or *végétation dermique*. This variety of wart consists of one, or a number, of pointed, club-shaped, or irregular mulberry- or cauliflower-like elevations situated upon the genitalia and adjoining regions. They may be sessile or pedunculated, and single or multiple, at times forming more or less solid masses of excrescence. In the male they appear most commonly on the penis, cropping out from the glans, the sulcus, and the inner surface of the prepuce; in the female, they are an outgrowth from the inner surface of the labia, or from the vagina. They are also met with in the perineum, anus, mouth, axillæ, umbilicus, toes, and other portions of the body. Warts of this variety vary from pale to blood red, or even purple, the tint depending upon the region involved, its vascularity, and the condition of the epidermis. When the surface is dry and the epidermis is preserved, they present the normal color of the skin. On the other hand, when, from hypersecretion or friction, the epidermis is macerated, they assume a bright or deep red color. In the latter event, their surface is covered with decomposing pus, and occasionally crusts, from which a most unpleasant or offensive odor emanates. They grow luxuriantly, sometimes becoming as large or larger than the fist. They may remain for an indefinite time. Moist warts assume various appearances in different regions, according to the manner in which they are arranged, and have been compared by writers to cauliflowers, mulberries, raspberries, bunches of grapes, and cockscombs. They occur in both sexes and at all ages, but are of more common occurrence in young persons, especially among those who have had venereal diseases.

**Pathology.**—Anatomically, the various forms of warts differ to some extent, but all have a connective-tissue base, from which papillary excrescences spring. In the ordinary wart, one or more papillæ become greatly enlarged, and are supplied with dilated vascular loops, and covered with more or less hypertrophied epidermis. The filiform wart consists essentially of connective tissue containing a minute capillary vessel. In condylomata, or venereal warts the papillæ are greatly hypertrophied, but the horny layer is usually absent or macerated.

**Etiology.**—Warts may develop without any apparent cause, or they may depend upon constitutional impairment or local irritation; want of cleanliness, contact with various substances, pressure, friction, and exposure to cold or heat may be mentioned as conditions which produce them. Some cases appear to develop as a result of contagion. They are very frequent among children, especially upon the hands. Workmen in petroleum refineries are subject to warty growths, principally upon the hands and forearms. Dr. Kühnemann has found in sections of warts, slender bacilli, both in and between the cells. This organism is said to be always present in the prickle layer and to exhibit distinctive qualities as regards its capacity for staining with certain coloring agents. In several instances, Dr. Jamieson has been able to trace the origin of verruca digitata to the use of rancid oil or pomade. Condylomata or venereal warts,—which are never a manifestation of constitutional syphilis, and should not be confounded with the vegetating syphiloderm—are caused by the irritation of the secretions of gonorrhea and leucorrhea.

**Treatment.**—It is occasionally advisable to give remedies which will have a tonic action upon the system, such as iron, codliver oil, bitter tonics, and arsenic, the latter being particularly recommended by McCall Anderson. Constitutional treatment is especially necessary in weak, anemic, or scrofulous children who are afflicted with large crops of papillary excrescences. The tincture of iodine (in ten-drop doses twice daily) is sometimes successful in removing or checking the growth of warts. Thuja occidentalis, in the form of fluid extract or tincture, is often able to effect removal. The tincture is given in doses of five to thirty minims or more three times daily, and may at the same time be employed as a local application. Magnesia has been thought to favor retrogression. It is given in small doses twice daily, before meals, from three to fifteen grains (0.18 to 1 gm.) in all being administered. Magnesium sulphate, or epsom salt has been used for the same purpose with marked success. Locally, warts may be removed by excision, scraping, caustics, electricity, compression, and various medicated substances. The common and filiform wart is best cut out with a knife or curved scissors, and the base touched with a stick of nitrate of silver or chloride of zinc; after excision the parts may be drawn together with sutures. The application of compression with a band or bandage, when a large surface is involved, is effective. Plasters containing mercury, or salicylic acid, are likewise of service. Electricity, either static or galvanic, by discharging the spark into the growth, has been found useful. The tincture of iron, also salicylic or boric acid, in solution, ointment, or plaster form, is valuable. Phenol, chromic and mineral acids are efficient; but the surrounding skin should be protected by a circle of wax. Kaposi recommends a solution of corrosive sublimate, one in thirty parts of flexible collodion. The solution is applied once daily by a brush to the wart and around its base. Another formula, emanating from the same source, contains 150 grains (10 gm.) of flowers of sulphur, 375 grains (25 gm.) of glycerin and 75 grains (5 gm.) of pure acetic acid, applications being made every day. Salicylic and lactic acids have also been successfully employed dissolved in collodion. Salicylic acid, dissolved in flexible collodion (10 per cent.), to which an equal proportion of chrysarobin, may be added, if desired, is recommended by Bowen, for plantar warts. This should be painted on twice daily, the foot being subsequently immersed in hot water and rubbed with pumice to remove the surface destroyed by the application. Hardy has advised lotions of pure vinegar. Vigier has used with success aseptol, or sulphocarbol (orthophenol-sulphuric acid), with which the growth is touched once or twice daily. Unna[1] employed a combination containing ten grains (0.60 gm.) of arsenic trioxide and 5 grains (0.30 gm.) of corrosive sublimate, to the ounce (32 gm.) of water. This preparation was applied on gauze, and kept on night and day for two weeks, at the end of which time all the warts had disappeared. The same practitioner is in the habit of using mercurial ointment containing from five to ten per cent. of arsenic trioxide. Applied upon linen, the wart gradually softens and is absorbed, leaving no trace. A creosote-salicylic plaster is also recommended by the same authority,[2] or the following ointment may be used as a substitute:

| | | | |
|---|---|---|---|
| ℞ | Acid. salicylici | ʒiij. | 12. |
| | Creosoti | f℥vj. | 24. |
| | Ceræ, | | |
| | Adipis | āā q. s. | M. |

Enough excipient is employed to make a firm ointment, which will adhere to the skin. The flat wart can be removed by excision, with the dermal curette or scraping-spoon. The latter is the most effective in warts occurring in elderly people—afterward applying a weak solution of chloride of zinc, or an ointment containing five to ten grains (0.30 to 0.60 gm.) of arsenic oleate to the ounce (32 gm.). Venereal warts, particularly if very vascular, are most successfully removed by the ligature, or by the galvano-caustic wire. The ligature of one or two will sometimes cause a group rapidly to disappear. The application of equal parts of powdered zinc oleate and bismuth subnitrate, or of calomel, alone or combined with boric acid, lycopodium, or salicylic acid, or powdered red cinchona-bark, will often cause them to vanish, leaving the skin normal. Formalin has been applied with excellent results to venereal warts, in the clinic, by Dr. Max Joseph, of Berlin. The warts were painted with formalin, and the surrounding healthy surface protected by a layer of vaseline. When the formalin had dried it was covered with a powder or small piece of cotton. G. E. J. Greene calls attention to the sun spurge, euphorbia helioscopia, popularly termed wart-weed. Its juice applied to the wart several times a day will cause disappearance. Cleanliness of the affected part in many cases will be the only treatment required.

**Prognosis.**—Warts are benign in childhood, and sometimes during adult age, but in the latter period and in elderly people they may, especially if picked or irritated, become the focus of malignant epithelial degeneration. Warts that receive treatment in time can generally be eradicated. Occasionally they are so extensive as not to permit of any interference. It is advisable, when warts are large or vascular, to remove only a portion at a time, in order to avoid hemorrhage and subsequent inflammation.

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[1] Monatsschrift f. pract. Dermat., 3, 1882.

[2] Monatshefte für Praktische Dermatologie, 1888, No. 13.

Papilloma.—An inflammatory new formation, or tumor, similar to verruca acuminata, has been described under this term by Duhring, Hyde, and others. It occurs particularly at the muco-cutaneous outlets of the body, and on mucous membranes.

## ICHTHYOSIS.

Synonyms.—Xeroderma ichthyoides—Ichthyosis congenita—Fischschuppenausschlag —Ichthyose—Porcupine disease—Fish-skin disease.

Ichthyosis is an hereditary or congenital hypertrophic disease, characterized by a general or local dryness, harshness, and scaliness of the epidermis, with sometimes an outgrowth of a papillary layer of the skin.

**Symptoms.**—Ichthyosis usually appears over the entire surface, but may be confined to and affect only certain areas. It may be mild or severe. If mild, it is denominated ichthyosis simplex; if severe, ichthyosis hystrix. The distinction between the two is one of degree. The disease may be so slight as to be scarcely noticeable, or, by the change or deformity that may follow from its development, may cause great anxiety and annoyance. While but two clinical forms are usually met with, still there is a third which, in respect to its origin, is called ichthyosis congenita.

Ichthyosis Congenita.—This form of ichthyosis, which is rarely seen, begins in intra-uterine life. The child is generally born before the usual period of gestation; it is small, weak, and imperfectly formed; the eyelids, ears, and lips may be wanting; the skin is inelastic, mapped out in furrows, split, and fissured, the fingers and toes being shortened and bent. Should the child be living, it usually dies a few days after birth. Jahr has recorded the case of a child which lived nine days. At times an infant apparently healthy at birth develops ichthyosis during the first week. Two such cases have been reported by Roma.

Ichthyosis Simplex.—This is the mildest form of the disease, and is the one generally encountered. It has been designated xeroderma (dry skin). The hypertrophy appears to be confined to the epidermis. The entire surface is not only dry, but also harsh, wrinkled, and poorly nourished, instead of being soft, smooth, and pliable. As a consequence, the integument has an unnatural, and often a parchment-like appearance. There seems to be less subcutaneous fat than usual, and the natural lines and furrows stand out more than in the normal condition, and are attended with more or less scaliness. The scales vary in size, some being small, thin, and furfuraceous; others large, thick, and in the form of plates, like those of a fish. The furfuraceous or bran-like scales are usually seen on the head, and the larger ones on the extremities. In shape the scales correspond to the natural lines and furrows of the part on which they occur. The scales form on the extremities polygonal or diamond-shaped plates, separated from each other by lines or furrows. They are usually firmly attached in the centre, loosely at the periphery, and have a white or farinaceous appearance; or, if thick and well developed, assume a shade ranging from dirty, grayish white to yellowish green, brown, or even black. These different hues of the scales are due to dirt and other extraneous matter, as well as to the presence of pigment-granules. The extent and amount of the scales depend upon the character and duration of the disease, the age of the patient, and the attention given to bathing and other external means of treatment. The parts most often affected are the extremities, though the disease may manifest itself upon the face, and in some instances the lips alone are involved.

ICHTHYOSIS HYSTRIX.—This severe variety is but an exaggeration or a higher development of the milder form of the disease. The line of demarcation may be very slight or well marked. It may occur in localized patches, or be distributed unequally over part or all of the surface, sometimes following certain nerve-tracts. An interesting case of the latter description has been reported by Dr. August Koren at a meeting of the Christiana Medical Society, April 24, 1889. The disease, which was named ichthyosis linearis neuropathica, extended in the form of brownish, papillomatous stripes along the course of the radial, median, and ulnar nerves. The stripe situated over the median nerve reached only as far as the wrist joint, that over the radial extended as far as the dorsal surface of the first joints of the thumb and index finger, while that over the ulnar pursued its course along the palm of the hand to the tip of the little finger. The tips of the other four fingers were likewise slightly affected. The subject was a boy, nine months of age. A bilateral case of the same nature was observed by Dr. Butruille, linear stripes of ichthyosis being developed over both sciatics.[1] In ichthyosis hystrix the part affected is the seat of irregular or polygonal masses of all tints, more commonly greenish and black, and between them the normal lines and furrows stand out distinctly. These masses can be picked off, exposing a dry and shrivelled skin, beneath which can be seen sebaceous ducts distended by plugs of sebum that have been left clinging to the detached plate. In some cases the patches present a rough, papillary, or warty growth, having a horny, pointed, round, or spinous appearance, the latter often being several lines in length, and, from its resemblance to the quill of a porcupine, this form has been termed hystrix. These patches are usually situated around the elbows and the back, also the neck, the axillary region, the umbilicus, the knees, and the ankles. The age of the patient, the duration of the attack, and the attention given to the removal of the masses, are factors in the severity and development of both varieties of the disease.

Ichthyosis seldom manifests itself until a few months or about the second year after birth. The child, as a rule, is born apparently healthy, but gradually the roughness and dryness of the skin become visible. The

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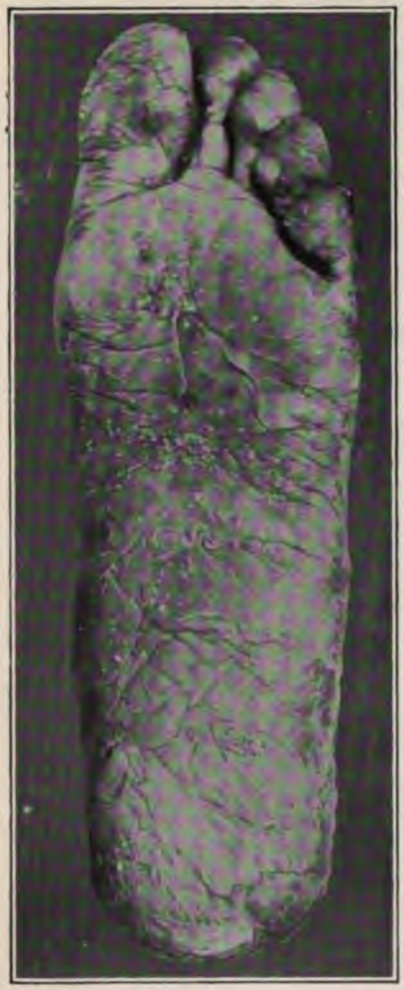
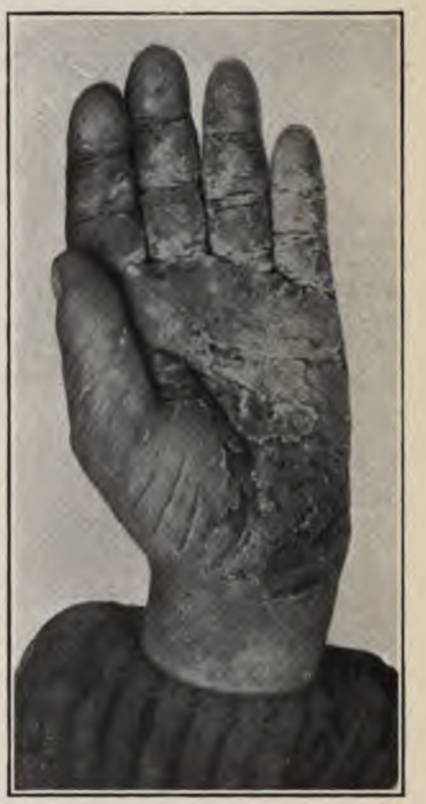
[1] Journal of Cutaneous and Genito-Urinary Diseases, February, 1890, p. 57.

# PLATE XX



A case of Chronic Plantar Ichthyosis or Keratosis Plantaris.
(See page 603)



A case of Chronic Palmar Ichthyosis or Keratosis Palmaris.
(See page 603)

disease first makes its appearance upon the surface of the limbs, especially the elbows and the adjoining parts of the arm and the forearm, the legs, and about the knees and ankles, and on these members it is usually most marked and most developed. In some instances, the disease is limited to the palms and soles. A case of ichthyosis plantaris has been reported[1] by Dr. Allan Jamieson. The patient was a man, aged thirty-five years, whose father had a similar affection. The horny growths had reached a thickness of nearly half an inch. Ichthyosis, if not confined to the regions named, spreads until it covers the whole surface of the body. The disease usually manifests itself in the latter way, the entire skin having the appearance of being sprinkled over with meal; the thick, rough, and scaly condition being especially prominent on the extensor surfaces, the contrast being noticeable in comparison with the flexor regions, which are ordinarily free from incrustation. The scalp is rough and dry, and covered with furfuraceous or branny scales. The hair is also rough, dry, brittle, and lacks its peculiar normal lustre. On the face, the skin may be mapped out in the form of plates, or the eyebrows and eyelids may be slightly scaly, but, as a rule, this region is seldom affected.

Ichthyotic persons are usually thin, and their skin is extremely sensitive to atmospheric changes. In severe weather especially the integument becomes tender, irritable, and frequently cracks. Sometimes there may be slight itching on exposure to the air, more marked on retiring at night. The affected skin is dry and wrinkled, the normal lines and furrows stand out prominently, and perspiration is generally slight; the extremities are usually cold; the nails poorly developed, dry, and break easily. As a rule, little or no itching accompanies the disease. The thickening of the epidermis is great, especially on the palmar and plantar surfaces. Again, there may be seen over portions of the body small polygonal plates, resembling those of the alligator. Dr. Fox has reported a case presenting this appearance.[2] Ichthyotic, more or less pigmented patches are sometimes observed along the course of certain nerves. The papillæ may or may not be enlarged. In the former case perversions of sensibility may be present.

The disease is essentially chronic, lasting, perhaps, the lifetime of the afflicted person, but, singularly, never involving the general health. In winter the disease is more severe and more marked than in summer. During the latter season and sometimes in the spring the increased activity of the sweat-glands may so modifiy the altered epidermis, as to leave the skin for a while apparently normal; but a relapse occurs with the advent of cold weather. Cases are reported as having been cured after an attack of an acute exanthem.

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[1] British Medical Journal, February 23, 1889.

[2] "The Alligator Boy." A case of Ichthyosis, well illustrated. Journal of 's and Venereal Diseases, April, 1884, p. 97.

**Diagnosis.**—The history of the disease, its congenital or hereditary nature, the dry, rough, scaly or parchment-like condition of the skin, and more or less hypertrophy of the papillæ, its distribution in certain regions, the dull-white appearance of the surface, and the absence of redness, are characteristic of the disease and are sufficient to distinguish ichthyosis from all other cutaneous diseases. Localized patches of old cases might, however, be confounded with seborrhea. In the latter disease there is no evidence of an ill-nourished state of the skin, or papillary hypertrophy, as in the former, and the scales will be found to cover the dilated ducts of the sebaceous glands.

**Pathology.**—Ichthyosis will present different morbid conditions, in accordance with the severity of the disease. In a well-marked case, from which I made a section, the epidermis was enormously increased, and consisted of many heaped-up lamellæ. The mucous layer was somewhat hypertrophied and slightly separated from the stratum corneum. The papillæ were enlarged and slightly infiltrated with cells. The blood-vessels were also enlarged, but the glands and follicles remained unchanged. Neumann, in more advanced cases, in addition to other hypertrophic changes, found the vessels dilated, the cutis thickened, and its connective tissue condensed in bands; the hair-follicles lengthened and containing lanugo; an increase of the external root-sheath; the glands dilated, particularly the sebaceous, which had a cyst-form; and the subcutaneous fat diminished. In some typical cases the epidermis was in lamellæ, ranging in color from yellowish to dark brown; and the hair-follicles and sebaceous glands were absent. Kaposi has also reported a case in which the sebaceous and sweat glands were absent.

**Etiology.**—Ichthyosis is a congenital or hereditary disease, developing at an early period of life. It may be transmitted by either parent. It is found among all races and in all parts of the world. Ichthyosis is equally common in both sexes, and can be transmitted not only by the father or mother, but also by the grandparents. The parents of ichthyotic children are devoid of constitutional taint, and, with their offspring, always enjoy, excepting this deformity, the best of general health. In some large families several children may be affected, while in others equally large, only one member will present the disease, the others being entirely free from it.

Dr. J. W. Hunt, of Anderson, Ind., has communicated to the author notes of two marked cases occurring in a brother and sister.

When the affection makes its appearance, it gradually increases until adult age, and continues with but little change for the remainder of life. Again, cases will occasionally be seen that can not be traced to either parents or grandparents, but may have arisen from some influence which affected the mother during pregnancy. A condition approximating or analogous to ichthyosis occasionally occurs among the laborers in petroleum oil works.

**Treatment.**—Internally we must treat all of these patients constitutionally, and teach them correct habits as regards their diet and mode of living. Their occupation should be in the open air if possible. The sun's rays usually have a good influence upon the disease. Medicinally, we give a good tonic to build up the nutritive processes; for this the official syrupus ferri, quininæ, et strychninæ phosphatum is elegant. A half teaspoonful four times daily will be a full dose for a child. The diet should be nutritious and food should consist chiefly of milk and eggs. Arsenic and the nutritive oils are the only remedies which appear to make any impression upon the disease. The persistent employment of these agents will produce a beneficial effect on the integument, which is, however, by no means permanent. It is probable also that the persistent use of small doses of pilocarpine will at least ameliorate the manifestations of ichthyosis. Thyroid medication seemed to be beneficial in a number of reported cases.

Local treatment is by far the more important and beneficial. Agents should be employed that have the power of softening and removing the accumulated epidermic masses and the extraneous matter, exercising at the same time a favorable influence upon the skin. Water is the best remedy for this purpose, used either alone or in combination with soft or medicated soap, or in the form of a medicated bath, the alkaline being especially serviceable. At intervals a hot-air or vapor bath, simple or medicated, should be employed. In severe cases, where the caking is marked, it is necessary to scrape off the masses with the curette or a knife, and to touch the parts afterward with a mild caustic solution. After the bath, and on rising in the morning and retiring at night, if convenient, an oily substance should be applied to protect the affected surface and aid its nutrition. Among the useful remedies to employ for the local treatment may be mentioned the oil of ergot, the oil of corn, oil of sweet almonds, olive oil, linseed and codliver oils, simple and benzoinated ointment, suet, purified wool-fat, glycerin diluted with rose-water, or one of the petroleum products. The following formula may be used with advantage:

| | | |
|---|---|---|
| ℞ Olei ergotæ | f℥iij. | 96. |
| Ung. hydrarg. oleatis (10 per cent.) | f℥j. | 32. |

M. Sig.: Apply once or twice daily, especially after bathing.

In using mercurials by inunction the danger of ptyalism must be kept in mind.

The following ointment is also valuable:

| | | |
|---|---|---|
| ℞ Acidi benzoici | gr. v. | 0.30 |
| Ung. aquæ rosæ | ℥j. | 32. |
| Adipis lanæ hyd. | ℥ss. | 16. |

M. Ft. ungt.

Milton and Duhring recommend an ointment of potassium iodide, ten to twenty grains (0.60 to 1.30 gm.), and lard, one ounce (32 gm.). An ointment containing ichthyol or sulphur is of service in softening the skin and removing the epithelium. Sulphur can also be applied to the skin in the form of a vapor. A stimulating ointment, which at the same time is valuable for its emollient effect, is one containing:

| | | | |
|---|---|---|---|
| ℞ | Acidi salicylici | gr. xl. | 2.67 |
| | Unguenti plumbi subacetatis | ʒiv. | 16. |
| | Unguenti zinci oxidi | ℥j. | 32. |
| | Petrolati | ʒiv. | 16. |

M. Ft. unguentum. Sig.: Apply locally to the affected parts twice daily.

A resorcin ointment has also been employed, in the strength of three to twenty per cent., according to the severity of the disease.

**Prognosis.**—Ichthyosis is an incurable affection. Patients should always be apprised of this fact. They should likewise be informed that, by the use of the proper external treatment, the deformity can be lessened, but that no remedy or class of remedies has been known to cure the disease. Ichthyosis will continue throughout the life of the person affected, occasionally almost disappearing during warm weather, to return again during atmospheric changes or the winter months.

## SCLERODERMA.

**Synonyms.—Sclerema—Scleriasis—Scleroma adultorum—Chorionitis—Sclerostenosis—Cutis tensa chronica—Dermatosclerosis—Sclerosis corii—Hautsclerem—Sclérème des adultes.**

Scleroderma is characterized by a diffuse or circumscribed, pigmented, indurated, rigid, and hide-bound condition of the skin. It may be acute or chronic.

**Symptoms.**—Scleroderma commences, as a rule, without either constitutional or local disturbance, the first symptom to which the patient's attention is usually attracted being a slight stiffness or hardness of some portion of the skin. It is not uncommon for pain to occur as an early symptom. In exceptional cases it may begin with chills, fever, swelling, and a feeling of numbness and formication, or a pigmentation of the part. The rigidity, which then sets in, increases gradually in extent and severity, often requiring months or years, or rarely more rapidly spreading, until the affected part is more or less sclerosed. The morbid process may occur on any portion of the body, but it is most frequently observed on the upper and to a much less extent on the lower extremities. The disease may be diffused over all or the greater part of the surface, or be limited to one or more patches or streaks which bind down the skin, as, for example, across the mammæ. Scleroderma generally develops upon both sides of the body, though the lesions may not be symmetrically arranged. The skin of the affected part is thick, rigid, hard, and has a feeling to the touch of *firmness,* tightness, and coldness, or, as Thirial states, very much like the skin of a frozen corpse. The sclerosed tissue passes insensibly into the normal skin, presenting no line of demarcation, but having at times a hyperemic tract around it. The surface is swollen, moderately elevated or shrunken, smooth, shining, somewhat scaly, pale white in color, as if it were bleached, or like wax, brownish-red or pigmented in patches, with sometimes a slight or severe papillary hypertrophy similar to a local ichthyosis. The mucous membrane, particularly around the mouth and vagina, may likewise show a similar change. The mucous membrane of the genitalia is usually attacked about the period of the grand climacteric. Generally the entire mucous membrane is affected, but at times the disease is confined to patches, the membrane being pale, indurated, dry, and inelastic. The entrance to the vagina becomes gradually more and more constricted.[1] This condition has been termed *Kraurosis vulvæ.* It is almost impossible to pick up a fold of the skin, as it is immovable on the underlying tissue, neither will pressure produce any depression of the part. In typical cases, the various layers of the skin and muscles appear as if they had become united to the bones beneath. The face, if affected, becomes altered in every way. The orifices of the eyes appear diminished in size, the alæ nasi stretched, and the mouth contracted. The skin no longer wrinkles, and the features become rigid and immovable, like an inanimate object, failing in all respects to portray the impressions of the mind. To this respect the term "sclerodermic mask" is applied by the French writers. If the morbid process extends to the neck, rotation of the head is interfered with or can be made only with difficulty. Again, if the integument of the chest or abdomen becomes sclerotic, respiration is sometimes impeded. Lastly, if the limbs be involved, they appear as if shortened; the joints, especially those of the fingers and toes, become semiflexed, and their motion impaired, frequently interfering with the occupation of the patient. In this form of the affection the skin becomes atrophied, smooth, and attached to the phalangeal bones. The nails are atrophied and deformed. Finally, the bones undergo absorption *in situ,* the fingers assume a slender, conical form, and are shortened by mutilation; except in rare instances, no pieces of bone are ever discharged. Dr. Eichhoff has described a case in which scleroderma was associated with and apparently dependent upon favus of the nails. Upon the basis of the favus ulcers, a general progressive scleroderma was developed and gradually involved the entire surface of the body. The scleroderma retroceded as soon as the original affection was cured. Rosenthal met with a case in which a little girl had suffered from scleroderma of the left side of the face and neck and upon the scalp. In consequence of this condition, atrophy of the left half of the face and alopecia circumscripta of the left side of the scalp had resulted. Krevet describes a case of general scleroderma in which the skin appeared to be too short over the entire body. In a case observed by Friedheim the disease of the skin was complicated by cutaneous hemorrhages. In some cases the disease of the skin follows the course of certain nerves.

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[1] Lancet, April 19, 1890.

The surface temperature in this affection is either normal or slightly lower than in health. The secretory functions may be natural, excessive, or diminished, the skin often feeling greasy or dry. The sensibility of the part may be quite normal or slightly diminished. The subjective symptoms become more and more annoying. The skin, which was swollen, becomes contracted as the affection progresses, and gives the sufferer a hidebound feeling. Spontaneous neuralgic pains sometimes appear which may only be temporary, and usually seated in the bones and joints rather than the affected tissue. Pressure upon the sclerosed patches is frequently painful. The general health, as a rule, continues good, but in some instances diseases of the lungs, heart, or kidneys may develop and terminate in amyloid degeneration and death. Rapid action of the heart and exophthalmos associated with scleroderma were observed by Dr. Beer, and Dr. G. Singer found degeneration of the thyroid gland in a patient who had died from scleroderma. Eczema, acne, erysipelas, herpes zoster, variola, morphea, and keloid may occur as complications. Scleroderma may in rare cases disappear by involution, the hardness and discoloration of the surface fading, and softness, elasticity, and natural color returning. This retrogression may occur only in spots, the disease at the same time spreading by the development of new patches upon another area. In other cases the affected surface sooner or later becomes the seat of atrophic degeneration. The integument becomes thin, smooth, soft, shining, often somewhat wrinkled, milky white, red, or irregularly pigmented, and adherent to the bone. The immobility of the parts, with the disturbance of the circulation, leads to mortification, with ulceration of the skin. The disease may change from time to time, now becoming better, again worse, and so persist for years, the attending pain, loss of sleep, and disturbed nutrition leading to a fatal termination.

**Diagnosis.**—The diagnosis of scleroderma is not generally difficult; the cold, hard, callous, pigmented integument, which can not be lifted in folds, is seen in no other affection. It sometimes manifests a resemblance to *keloid,* but the latter consists of one or more circumscribed, cicatricial, usually reddish elevations, more or less painful.

Scleroderma is liable to be confounded with *morphea,* which is sometimes erroneously designated scleroderma circumscriptum; but from which it may be differentiated as follows:

Scleroderma usually begins without any subjective symptoms, the stiffness or hardness simply appearing over learge areas, as, for instance, the face, the neck, the trunk, or all the surface. Morphea begins by the development of a congestive reddish or purplish soft spot, of small area, and may be attended with pain or a tingling sensation. Scleroderma is generally symmetrical and rarely appears over definite nerve-tracts. Morphea usually commences on one side of the body and follows the course of the large nerves. Scleroderma presents an ill-defined margin which passes insensibly into the healthy skin, while morphea is sharply defined, with a surrounding purplish or lilac border. In scleroderma the integument is hard and immovable; in morphea the skin is soft, can be raised in folds, but is altered in structure, and contains enlarged vessels and striæ atrophicæ. In scleroderma the skin appears to be irregularly pigmented; in morphea it is usually a sombre yellow or ash color, except at its borders, which are pink or purplish.

Finally, scleroderma increases slowly, is persistent, and causes inconvenience and pain by the contraction of the integument produced by it; morphea, on the other hand, increases rapidly, but may disappear spontaneously, but if not, produces little or no inconvenience, and contraction rarely supervenes.

**Pathology.**—The immediate pathological changes in the skin in scleroderma consist of an increase and condensation of the connective-tissue elements. The corium and subcutaneous tissue are the portions chiefly involved. In well-marked cases, the elastic fibres are increased, the fat-cells and glandular structures are finally atrophied, and the thickened mass comes at once in contact with the bones. The vessels are numerous, but diminished in calibre by the pressure of the surrounding connective tissue. Cells accumulate in the perivascular lymph-spaces, around the vessels, and in the connective tissue of the part.

According to Kaposi, the pathological changes occurring in this disease are due to a thickening and stasis of lymph from an abnormal condition of the nutritive processes, the stagnation taking place in the lymph-spaces. The epidermis and the papillæ are primarily unaltered, but secondarily there may be an increased deposition of pigment in the rete, as well as in the upper layer of the corium.

Papillary hypertrophy may at times occur as well as hypertrophy of the muscular fibres and dilatation of the sweat-glands. The glands usually remain normal, except in the atrophic stage, when the new tissue decreases and mostly disappears, at which time they also undergo atrophy. Scleroderma, therefore, appears to be primarily a connective-tissue hypertrophy, probably arising from nervous disturbance, and ending in either resolution or atrophy. Goldschmidt has observed that the muscles were invaded in some cases. Méry has had the opportunity of making a post-mortem examination of the body of a girl, twenty-two years of age, in whom the malady ran a rapid course and who died in consequence of pericarditis. He found the muscles of the limbs hard, atrophied, and discolored. The microscope showed that a considerable development of interstitial connective tissue had taken place. Periarteritis, and especially endarteritis, affected the muscular arteries. The muscular substance of the heart was markedly sclerotic. In the case of Dr. Foulerton, the muscles had undergone complete degeneration and were of a grayish, waxy appearance, while the bones were much atrophied. Jacquet and De Saint-Germain, in a fatal case, found a number of small cavities in the gray matter of the spinal cord, occupying principally the lower part of the cervical enlargement. The cells of the cord throughout the greater part of its extent had undergone alteration.

**Etiology.**—The cause is involved in doubt. It is a very rare affection, but is seen at all periods of life. It is much more frequently met with among women, and the greater number of cases occur in middle age. A condition resembling this disease has been frequently produced upon the dorsum of the hands and fingers in persons exposed unduly to the x-rays. Among the causes that have been referred to as exciting the disease are exposure to cold, rheumatism, and great nervous strain or shock. The nervous origin of the disease has been pointed out by Schwimmer, whose cases showed disease of the peripheral nerves. Westphal observed pathological changes in the brain. Cases have been encountered in which scleroderma was associated with sclerosis of the cord, infantile paralysis, and Raynaud's disease.

Fouchard, from his studies of the subject, declares that:

(1.) The changes of diffused scleroderma have their point of origin in the vessels. (2.) The changes consist of newly formed cells, which are arranged in concentric layers around the vessels. (3.) These cells are not leucocytes, but are developed from the connective tissue. (4.) The vascular endothelial cells are swollen. (5.) The vascular atrophy affects the small blood vessels, the nerve vessels simultaneously with those of the cuticle and connective tissue. (6.) This vascular atrophy is the result and not the cause of the scleroderma. (7.) Pigmentation is a common symptom in the course of this disease, and that (8.) changes of the glands are frequently observed in the course of the disease, and it is possible that diffused and progressive scleroderma is caused by a disturbance of a number of the glands.

**Treatment.**—Good hygiene, food, and travel, with iron, quinine, arsenic, codliver oil, or other tonics and alteratives, will be of benefit. Locally, baths, massage, and stimulating ointments may be used, the mercurial and iodine being especially valuable. Dr. Moreau employs hot baths of three to four hours' duration, and conceives that their virtue is enhanced by adding to them a strong decoction of valerian root, and giving, in conjunction with the baths, daily massage with a pomade containing five drachms (20 gm.) of extract of valerian and six drops of essence of valerian to ten drachms (40 gm.) of petrolatum. Massage was used with striking advantage in

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[1] Thèse de Paris, 1906.

a case reported by Prof. Breda. Diffused sclerodermic patches had developed upon different portions of the body subsequent to a long attack of rheumatism. Applications of mercurial potash soap [sapo viridis ℥ ss. (16 gm.) and ungt. hydrarg. ℥ j (32 gm.)] or the ointment of copper oleate, one half a drachm (2 gm.) to the ounce (32 gm.) of lard, are also of benefit. The constant galvanic current has been recommended by Piffard, Fieber, and others; Schwimmer suggesting also the galvanization of the sympathetic. Boisseau has reported the successful treatment of a case by means of static electricity. A few cases have been reported cured by Bock, Brambilla, and Friedländer. The patient of Dr. Bock was a girl aged nineteen years, of healthy parentage and neurotic type, in whom the disease appeared after sleeping with the upper part of her body exposed to a draught. She came under treatment a few days later, and was cured by frequent frictions, massage, sulphur, and Turkish baths. Brambilla's patients were treated by means of copious diaphoresis and the internal use of salicylate of soda and tonics. Similar methods were employed by Friedländer, whose patient was a girl five years of age; about six months were required before the cure was effected. Pilocarpine may probably also answer a good purpose by virtue of its action on the sweat-glands. Debove reports amelioration, of a case involving the upper extremity, by spraying the surface with chloride of methyl. Brocq has witnessed marked improvement by means of electrolysis in a case involving the arm and forearm in the form of a band an inch or two in width and very thick. After fourteen sittings, each comprising twelve or sixteen punctures of the electrolytic needle, the disease was arrested, and has since remained stationary. Though treatment has, in a few instances, proved of advantage, yet the disease, as a rule, is uninfluenced by any therapeutic method.

**Prognosis.**—The prognosis of scleroderma should always be carefully guarded, as the disease varies in course and termination. Recovery sometimes occurs through spontaneous involution, or the malady may continue during the entire life of the sufferer. A fatal termination may at times follow complication with some other affection. If the stage of atrophy has begun, the normal condition of the surface will not return.

## SCLEREMA NEONATORUM.

Synonyms.—Scleroderma neonatorum—Induratio telæ cellulosæ neonatorum—Algor progressivus—Das Sclerem der Neugeborenen—Décrépitude infantile—Sclerema of the new-born.

Sclerema neonatorum is a disease occurring usually a few days after birth, and consisting of an induration of the cutaneous cellular tissue, generally of the lower extremities, characterized by discoloration, edematous swelling, coldness, and hardness of the affected part.

**Symptoms.**—The disease, which may be congenital, appears in new-born infants usually in from three to ten days, and rarely several months, after birth. At times the local symptoms are preceded or attended by rapid malnutrition and wasting, with more or less restlessness. The morbid process is usually observed first upon the lower extremities, beginning on the calves and rapidly spreading upward to the thighs, abdomen, arms, neck, and face, frequently involving the entire body. In some cases, though rarely, it is said to attack the face or body first, and later extend to the extremities. The skin of the affected part appears tense and shining, and may be pallid, red, livid, or of a brownish or yellowish color. It may be more or less mottled, and the epidermis may be smooth, wrinkled, or fissured. The part is also swollen and edematous, the surface cold, resistant, and indurated to the touch, incapable of being raised in folds, but pressure with the finger produces a depression in the skin. The edematous swelling, however, is sometimes absent, or hardly apparent; if present, it diminishes in a few days, but the parts remain cold, hard, and wrinkled. The temperature usually decreases, and the pulse and respiration also fall in frequency, although cases have been reported in which the temperature was normal and the pulse increased in frequency. The affected parts become almost or entirely immovable. If the disease involves a greater part or all of the skin, the body presents the appearance of a corpse. The child remains motionless for hours, or shows only faint evidence of life by feeble movements of the unaffected parts. The pulse and respiration at times become almost imperceptible, the rigidity of the lips interferes with feeding or renders it impossible, and the patient dies within a few days. Pneumonia, or other derangement of the respiratory or the circulatory systems, intestinal or urinary disease, usually coexists with sclerema neonatorum. Dr. Angel Money has observed this disease, occurring in three sisters, accompanied by partial paralysis of the extremities. All ended fatally, death being preceded by local clonic spasms of the face.

**Diagnosis.**—There is no difficulty in recognizing sclerema neonatorum. The edematous, cold, hard, characteristically colored skin, feeble circulation and respiration occurring in early infancy are sufficiently suggestive of the disease. The only affection with which it is liable to be confounded is edema of the new-born, both diseases having the symptoms of falling of the temperature, pulse, respiration, and the rigidity of the body in common. Edema of the new-born differs from sclerema neonatorum in being of longer duration, less fatal, the skin being movable over the underlying structures, the rigidity being slighter and the swelling more pronounced. The two diseases, according to Eustace Smith, may exist together, or sclerema neonatorum may succeed edema, as reported by Perot.

**Pathology.**—The skin of children affected with sclerema neonatorum becomes, after death, more decided in color, often changing to a blue, but the hardness and rigidity remain. On cutting the integument, dark bloody serum oozes out, followed by a yellowish fluid, the edema in the meantime disappearing and the indurated tissue becoming soft.

Sclerema neonatorum is said to show no other important change apart from this edematous infiltration and a firm, stearin-like deposit in the subcutaneous tissue. The results of the post-mortem examination of an infant who died of sclerema three days after birth have been reported[1] by Dr. J. W. Ballantyne. Upon making a section of the skin and subcutaneous tissue a sensation was conveyed to the hand like that produced by cutting bacon rind. The subcutaneous cellular tissue had a peculiar white, glistening aspect. No serous fluid could be expressed from the cut surface. Examined under the microscope, an abundant connective tissue was seen subdividing the subcutaneous adispose tissue into numerous patches of varying size. The connective-tissue bands were not only increased in number, but were much thicker than normal. The fat cells in some instances had lost all their fat. Small vessels were seen here and there, surrounded by numbers of leucocytes, and pushing their way into the clumps of fat cells. The papillae were not well marked, and the outlines of the cells of the rete Malpighii were ill defined. The horny layer appeared to be normal.

**Etiology.**—Sclerema neonatorum appears most frequently in children who are born prematurely, and occurs more often in winter than in summer. It may be caused by any constitutional or local condition which disturbs the respiration and circulation, such as pneumonia, bronchitis, heart disease, syphilis, premature birth, hydrocephalus, meningeal apoplexy, malnutrition, and exposure to cold.

**Treatment.**—The treatment should be first directed to removing the cause; if this can be done, the disease may be cured. The most important part of the treatment consists in keeping up the nourishment of the child either with peptonized milk, animal broths, especially beef and clam juice, chicken, lamb, mutton and oyster broths, or a suitable substitute, together with a certain amount of stimulant, as good brandy or white wine and sugar. As the child can not suckle or partake of sufficient nourishment, the food should be given through a tube. Forced feeding can be carried out by passing an elastic catheter through the nose and into the stomach, through which liquid food can be given regularly, as recommended by Eustace Smith. It is equally important to keep up the temperature of the body by moderate friction and by warm applications to the surface. Dr. Ballantyne advises that young infants be placed in an incubator. Dr. Money has reported the cure of one case by means of mercurial frictions. The administration of thyroid extract in some instances has produced prompt improvement in this condition of dense edema, and is worthy of further trial. If the arterial tension is low, benefit may be obtained from adrenalin.

**Prognosis.**—Sclerema neonatorum is usually a fatal disease, but recovery may ensue in mild cases.

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[1] British Medical Journal, February 22, 1890.

## MORPHEA—CIRCUMSCRIBED SCLERODERMA.

SYNONYMS.—Sclérodermie en plaques—Addison's keloid.

Morphea is a chronic disease of the skin, characterized by the appearance of one or more isolated points, lines, bands, or patches, which are primarily hyperemic, sometimes slightly elevated, surrounded with a pink areola, and which later become level with the skin or slightly depressed. In color they are white or yellowish or pinkish, with a polished aspect.

**Symptoms.**—This disease, which was known as Addison's keloid, presents a number of appearances, as it assumes one form or another, and according to its stage of development. It frequently begins with one or more isolated, circumscribed, rounded, ovalish, or elongated, hyperemic, pink, or violet patches, varying in size from a fraction of an inch to several inches in diameter. The patches may continue to increase, or several may coalesce until they become as large as the hand. After having become well defined and circumscribed, they are surrounded with a pink or violaceous areola composed of a network of vessels. At times, bunches of these minute capillaries are also distributed over the surface. The affected skin in its early stage may be slightly swollen or elevated. At a later stage this condition disappears, and the patch becomes level with the surrounding skin or somewhat depressed. In color the patch is pink or purplish, yellowish or whitish. The surface is usually smooth and shining, appearing like polished ivory, wax, marble, or alabaster, and looking as if a substance like lard or bacon had been deposited in the skin. Tilbury Fox likewise observed the same change in the mucous membrane of the inside of the lips, and others have seen it in the surface of the pharynx. In old cases there may be more or less desquamation of the skin. The adjacent skin is apt to become yellow, brown, or mottled. To the touch, a fully developed patch is generally firm, brawny, and inelastic, and can be pinched up only with difficulty. It is not uncommon to find, on palpation, little or no change of the integument; the sensibility may be diminished, but, as a rule, in the early stage it continues normal. In some cases, the patches having become fully developed, may remain in this condition indefinitely, or they may rapidly or slowly undergo spontaneous involution, the skin returning to its ordinary condition. In other instances, atrophic changes occur, the patches becoming contracted, dry, shrunken, parchment-like, and often bound down to the underlying parts. The glands are also generally atrophied, and their secretions are diminished or absent. After a time the subcutaneous and muscular tissues undergo atrophic alteration. Small or large, round, elongated, or irregularly shaped cicatriform lesions result, with more or less deformity and loss of function.

Morphea may also appear in the form of groups or scattered, small, pit-like scars, intermingled with capillaries, and white, glazed maculæ and furrows, developing the characteristic atrophic spots and bands—*maculæ* *et striæ atrophicæ.* In addition there may be present reddish or purplish telangiectases, with more or less yellowish or brownish pigmentation around the patches. These lesions may continue indefinitely or undergo spontaneous involution, or they may gradually assume the waxy, lardaceous condition already described.

Morphea manifests no tendency to symmetry. The lesions may occur upon any part of the body; but they appear by preference on the face, neck, chest, back, abdomen, arms, and thighs. They may be quite irregular in their distribution, or may, as is frequently the case, follow certain nerve-tracts, as, for instance, the branches of the fifth nerve or the sciatic.

Subjective symptoms are apt to be absent, the lesions developing and persisting without any marked symptoms, although pain, tenderness, and a tingling have been known to precede and accompany the disease. Morphea is a rare affection, chonic in its course, often continuing for years.

**Diagnosis.**—The diagnosis between scleroderma and morphea is discussed under the former disease. The atrophic striæ, as observed in one form of morphea, are with difficulty distinguished from the normal lineæ albicantes, such as occur after pregnancy or ascites.

In some cases of papillary carcinoma of the skin, especially of the female breast, *cancer en cuirass,* the resemblance to scleroderma may be very close. The diagnosis may be made by finding carcinomatous nodules in the skin or the nipple, and the neighboring lymphatic glands become enlarged; there is also a cancerous cachexia and a tendency to ulceration.

The anesthetic spots of *leprosy,* which resemble those of morphea, as well as many other phenomena common to each, point very strongly to the neurotic nature of both affections. The patches of leprosy, however, are not waxy white from the beginning of the disease, as they become very soon in morphea; and, further, the other well-marked symptoms, which in addition occur in the more serious affection, are all-sufficient to lead to a proper diagnosis.

The spots of *vitiligo* bear more or less resemblance to morphea patches, but in vitiligo there is simply a diminution of the pigmentary matter of the rete Malpighii, with no textural change whatever, while in morphea there is always a structural alteration in the skin.

**Pathology.**—Microscopical investigations have thus far developed very little in reference to the pathology of morphea. Crocker, who examined patches in the early stages, noted pigmentation of the deeper layers of the epidermis, atrophied papillæ, and a copious infiltration of cells around the glands and vessels. In the latter stages, these cells developed into fibrillar connective tissues, which shrank, followed by obliteration of blood-vessels and atrophy of the glands. Duhring, on the other hand, found, from an examination of a white patch of some months' standing, simply a conden- [illegible] f the connective tissue of the corium, with a shrinkage of the [illegible] er.

**Etiology.**—The cause of the disease is not positively known. Hutchinson believes it is neurotic in origin. Wilson, Tilbury Fox, Crocker, and others have pointed out its frequent occurrence along the course of distinct nerve-tracts, but it has also been observed in areas remote from them. In confirmation of those who believe that the nervous system is at fault, in producing morphea, may be mentioned its occurrence with such other neurotic affections as canities and alopecia circumscripta. It occurs at all ages, and in the robust as well as in the weak, but is more frequently observed in women than in men.

**Treatment.**—The milder forms of morphea, which are hid by the patient's clothing, generally require no attention. Such cases sometimes recover without any treatment. The more severe cases of the disease, especially if on the face or exposed portions of the body, call for both constitutional and local treatment. Iron, quinine, phosphorus, codliver oil, arsenic, and the chloride of gold and sodium are especially useful. Locally, massage, galvanism, mercurial potash soap, and mercurial lotions, singly or in combination, are of service.

**Prognosis.**—The course of the disease is usually chronic, continuing often for life. Spontaneous recovery may occur in a short time after its appearance. This is especially the case in the milder forms of the disease. If atrophy, however, has occurred, the skin can not be restored to its natural condition. Very rarely, gangrene of the extremities has been observed.

HEMIATROPHIA FACIALIS.—In connection with morphea it might be well to mention the disease known as hemiatrophia facialis, or unilateral atrophy of the face. This appears to be closely related to, or is a variety of, morphea, but the morbid process is deeper seated than in the latter affection. It consists in atrophy not only of the skin, but also of the subcutaneous cellular tissue, the muscles, and sometimes even the bones of a portion or of all of one side of the face. Inasmuch as the lesions of morphea have been observed in some of the cases of unilateral atrophy of the face, and this also occurs in sclerodema, it is probable that both diseases are closely related and of the same nature.

## ELEPHANTIASIS.

**SYNONYMS.—Elephantiasis arabum—Pachydermia—Bucnemia tropica—Spargosis—Morbus elephas—Elephant leg—Barbadoes leg—Cochin leg.**

Elephantiasis is a chronic hypertrophic disease of the skin and subcutaneous connective tissue, characterized by a very marked increase in size of the affected part, accompanied by inflammation of the vessels and lymphatics, swelling, edema, thickening, induration, more or less pigmentation, fissures, and warty growths. Tropical or true elephantiasis is of parasitic origin and is the result of the introduction of filaria into the blood and lymph-channels (*Filariasis elephantiaca*), which also causes endemic chyluria.

**Symptoms.**—The disease generally manifests itself as an erythema, or an erysipelatous inflammation, or a dermatitis, accompanied by more or less severe constitutional symptoms, such as rigors, prostration, fever and delirium (elephantoid or filarial fever). The skin is red, swollen, hot, and painful, and the entire affected region is somewhat enlarged. Relapses occur from time to time without any assignable cause, with a recurrence of fever, as a result of which the part still further increases in size and becomes fissured, indurated, discolored, and covered with papillary excrescences giving it a most deformed appearance. Elephantiasis occurs on various portions of the body, attacking by preference the legs, feet, scrotum, penis, labia, and clitoris; less frequently, the anus and upper extremities are involved. Cases are also recorded in which the external ear, eyelids, nose, cheeks, and mammæ have been invaded, and in rare instances the disease has developed upon the chest, back of the neck, the abdomen, or the tongue.

A case of nevoid elephantiasis of the face has been described[1] by Dr. B. Merrill Ricketts, of Cincinnati. A port-wine discoloration extended from the lower margin of the wing of the nose to the top of the ear on each side. The skin of the nose was neither thickened nor discolored. The ears suffered from discoloration alone; but the skin upon the chin was so heavy from increased thickness that the lower lip was pulled down and became a part of the hypertrophic mass. The diseased skin was from a half degree to one degree lower in temperature than the skin of the forehead, and more sensitive to cold. The hypertrophied skin was of the same deep-red color.

The symptoms of elephantiasis will differ according to the part invaded. When the legs are involved the disease is usually confined to one member, which, after repeated attacks, is enormously increased in size, especially from the knee to the ankle, the foot, when involved, becoming a shapeless mass. The thickened and unwieldy limb presents a most distorted aspect. The hypertrophied cutis, which is tightly stretched, is united to the underlying tissues and pits on pressure slightly; but the tissues beneath are felt to be brawny and indurated, and perceptibly increased in volume. Deep manipulation develops a hard, resisting, conglomerated tissue; the separate structures, especially the muscles, can not be distinguished from the mass. Enlarged lymphatics, or the saphena vein, may be traced to the upper part of the thigh as hard, rigid bands. The skin may be either smooth, shining, pale, red, brown, brownish-red, or rough and dark in appearance. Fissures, warty growths, tubercles, and often an eczematous condition, occur on various parts of the limbs. The skin may here and there be deprived of epidermis, bleed, and weep; or lymphatic vessels be opened up, causing lymphorrhea; scales and crusts may follow from the poured-out material. Ulcers of various sizes may also develop, from which a sanious and offensive fluid oozes over the surface. Movement of the limbs is painful, and either greatly impeded or rendered almost impossible. More or less febrile disturbance accompanies each attack, and there may also be pricking, stabbing, or boring pain. Headache, gastric irritability, or even delirium may occur.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, April, 1889, p. 140.

A remarkable case has been recorded by Dr. T. J. Bennett, of Austin, Texas. The patient was a negress aged fifty years, and naturally corpulent. The disease had existed for fifteen years, nearly the whole of the body being more or less affected, the trunk and upper extremity as well as the lower limbs, the woman's weight being about four hundred and forty pounds.

In elephantiasis, the labia, clitoris, and scrotum, when affected, become enormously enlarged. The scrotum may extend to the knees or feet; the penis contracts and is completely lost in the thickened mass. The skin becomes hard, rough, warty, and tuberculated; the urine in being voided passes along a furrow formed in the hypertrophied skin; fissures, excoriations, and ulcers are developed, or the lymphatic vessels are corroded and pour out their contents, producing a most obnoxious and offensive appearance and odor; walking becomes impossible and the patient's very existence is a burden. Elephantiasis is sometimes accompanied by chyluria (also a manifestation of filariasis), especially in tropical countries. The disease was formerly regarded as a form of *leprosy,* which is not, however, attended by febrile attacks and local inflammation.

**Diagnosis.**—In the early stages of the disease, and before the thickening and enlargement of the parts has set in, it is almost impossible to make the diagnosis. The recurrent attacks of inflammation of the part, especially when confined to one limb, point to the probable disease which may develop, and will be a valuable guide for the physician to watch its course carefully and note any increase in the size of the part. After the affected region has become enormously hypertrophied, and covered by the primary and secondary lesions referred to, an error in diagnosis is almost impossible. The microscopic examinations of a drop of blood taken at night will usually reveal living filaria. *The edema of the lower limbs* in kidney disease, is attended by great enlargement of the parts, but the skin is thin, smooth, and natural, and the constitutional symptoms are different from those occurring in elephantiasis.

**Pathology.**—The diseased tissue is hard and resisting, and when cut through to the bone exhibits a homogeneous, white, yellowish, or lardaceous mass, from which a yellowish-white fluid exudes spontaneously or from pressure. The various layers of the skin are matted together and can hardly be distinguished. The corium is thicker and more dense in structure, but the subcutaneous tissue is enormously hypertrophied. The fascia and intermuscular septa are thickened, exhibit evidences of fatty degeneration, and are changed in color, being generally pale or brownish-yellow; the bone is thickened, hardened, smooth or irregular, and covered with exostoses, According to Virchow, these exostoses may unite together the tibia and femur, the tabia and fibula, the ankle-joint and the metatarsal bones. Hauke has pointed out that in the midst of the sclerosed portion of bone there may be likewise carious or necrosed parts. Microscopic examination has demonstrated that while the epidermis and corium are altered in structure, they are increased in thickness at points which are the seat of papillary and warty elevations. The papillæ in these regions are widened and elongated. The blood-vessels and lymphatics are enlarged; new connective tissue, formed of delicate fibres, with many nuclei and cells commingled, is also encountered. The glands and follicles may be found unaltered or widely separated, or, by the pressure of the hypertrophic mass, they as well as the fat-cells may be pushed aside, altered, or destroyed.

**Etiology.**—Elephantiasis may arise from any agency which produces inflammation and prolonged obstruction of the lymphatics. Two groups of cases may be recognized: (1.) Those due to internal or local causes (including streptococcic inflammation). (2.) Those due to a special cause of external origin. To the latter class belong the typical cases of elephantiasis of the tropics. This, as first demonstrated by Manson is due to the presence of a nematode worm—the *filaria sanguinis nocturna*—and its embryos in the blood and lymphatics. This parasite has been shown, by microscopic examination, to be almost invariably present in subjects of the disease in countries where it is common, and Manson believes that the mosquito is instrumental in propagating and spreading the disease. The female worm is slender, and fully three inches in length. The mosquito (culex fatigans) acts as an intermediary host, in which the embryonic filariæ grow and develop to a certain stage until opportunity is given to enter the blood of man. Thence they find their way into the lymphatics, where they mature. The filaria is found in almost every country throughout the tropical and subtropical world where this special mosquito exists naturally; or it is carried by ships or merchandise. The fully developed and mature filaria exists in the lymph-channels, and pours out swarms of embryos into the blood, usually at night-time, where they may be recognized microscopically, although they disappear during the day. This periodicity is reversed, however, when the filarial subject habitually sleeps during the day time and remains awake at night.

Elephantiasis may arise from the irritation of varicose veins, chronic eczema, ulcers, lupus, and even fracture of the bones of the limb. A. Ravogli, of Cincinnati, Ohio, reports elephantiasis of the penis and scrotum due to syphilis.[1] Wounds and erysipelas are also among the more common causes of the affection. In sections of the skin, streptococci are usually found, and Le Dantec claimed that the disease is of streptococcic origin. The enlargement of parts affected may follow repeated attacks of erysipelatoid inflammation, as in a case of elephantiasis of the penis and scrotum, in a cooper living in Bordeaux,[1] who had never been in the tropics. He had a malarial attack at 15 years. At 25, illness began by violent chill, followed by high fever, the skin over the penis and scrotum became swollen, red and painful. The symptoms then gradually subsided. Following this, at intervals of a month or two, chills recurred and fever, and fresh inflammation of penis and scrotum occurred. After each attack the parts were left larger than before, until the penis became the size of the forearm and the scrotum as large as his head; at 52 years of age blood taken from the lesions showed the presence of a streptococcus. Elephantiasis is seen in all regions, but is more common in tropical countries, as the West Indies, especially the Barbadoes Islands, in Africa, Arabia, Egypt, China, Australia, and Japan, being more prevalent along the sea-coast. Climate therefore favors the development of the disease to a certain extent. Elephantiasis occurs in both sexes, but is more frequent in the male. Surgeon-General Bidie, of the Indian Medical Service, states that elephantiasis is endemic in the Madras Presidency, especially upon the sea-coast, where there is a subsoil saturated with organic filth from which the natives draw their water. He instances a village between the canal and the sea, in which scarcely an individual escapes after the years of puberty. The water is very bad, being taken from shallow ponds fed by surface drainage, full of decaying vegetable matter and overgrown with reeds. Elephantiasis is liable to occur in both sexes, and young children are affected though the disease is not common before fifteen or sixteen years of age. Europeans are generally spared, but it is not uncommon among Eurasians.

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[1] Journal of Cutaneous Diseases, February, 1907.

A case of congenital elephantiasis was brought before the eighteenth congress of the German Surgical Association by Herr Waitz, of Hamburg. The child was born of healthy parents. At two years of age its lower limbs were already extraordinarily enlarged. Both blood-vessels and lymphatics were increased in size, and the extremities were covered with vesicles filled with lymph. Dr. Moncorvo has met with a number of cases of congenital elephantiasis and believes that it is much more common than is generally supposed. Dr. William Caldwell, of Belfast, has given a brief account of a case in which elephantiasis and fibroma molluscum co-existed in the same individual. Both conditions had been present since infancy. Elephantiasis, however, usually develops between the twenty-fifth and fiftieth years.

**Treatment.**—The prevention of the disease is accomplished by sterilizing the drinking water, and by protection from the mosquitoes. Dr. A. S. Ashmead, of New York, also points out the necessity of keeping the beds of elephantiasic cases screened, so that mosquitoes can not feed on them at night when the filaria are free in the blood. He considers an un-screened case of elephantiasis as a greater menace to public health than a leper. The mosquitoes after filling themselves with blood may infect the drinking water, and thus spread the disease. Filariasis is dangerously prevalent in the island of Barbadoes. If the disease is seen in its early stages it should be treated upon general principles. A change of climate is often advantageous. It is necessary that the patient have a nutritious diet. Alcoholic drinks should be prohibited. In reference to internal medication, iron and quinine have a good effect upon some, while general tonics, arsenic, or one of the iodides, benefit others. Thomasz, of Ceylon, claims[1] to have obtained very good results from the sulphide of calcium, particularly when given from an early period of the disease. His practice is for an adult to begin with a one-grain (0.06 gm.) pill of the drug morning and evening, after meals. In the course of a month this quantity is increased to one and one half grain (0.09 gm.), and subsequently to two grains (0.12 gm.). Inunctions and bandaging were conjoined. He states that elephantiasis of six months' standing may be completely cured by this method in one and a half to two months. Cases of long standing may be improved. Since Surgeon-Major E. Lawrence has reported[2] the cure of two cases of chyluria dependent upon the presence of filaria sanguinis by thymol, it should be advisable to make trial of that drug in cases of elephantiasis presumably due to the same parasite. Rest of the affected part during the inflammatory attacks is all-important, and if the extremities be involved they should be placed in a horizontal or elevated position. At these periods also it is appropriate to act upon the bowels by a saline cathartic. Suitable lotions of either lead-water and opium, arnica, or soap liniment, hot or cold, may be applied until after the inflammatory action has subsided. Soothing or slightly astringent ointments may be substituted if more grateful to the patient. After the disappearance of this stage of the disease, the alkaline, simple, or medicated vapor-bath should be employed, to remove all poured-out products and to soften up any thickening of the surface. Frictions may then be made with one of the mercurial or iodine ointments, together with the application of compression, which may diminish the pathological process or elephantoid swelling. In case the limbs are affected, compression may be made by a cotton or gum bandage (Biers' method). In the event that the part will not diminish rapidly, the entire surface may be punctured thoroughly with a small needle-knife from two to four times a week; the overdistended vessels are thus relieved, absorption assisted, and the hypertrophied extremity lessened in size. If eczema, warty growths, or ulcers are present, they may be treated according to the methods usually resorted to for these conditions. Electricity has been followed by favorable effects in the early stages of the disease. Dr. Silva Araujo, of Rio de Janeiro, has obtained very satisfactory results[1] by means of continuous and interrupted currents of electricity with electrolysis, together with massage and compression by the rubber bandage. His experience has extended through many years, during which four hundred cases have been under observation and treatment. It is essential that the treatment should be continued for a long time. Massage, likewise, has proved of benefit. Deep manipulation of the affected part has been productive of very striking and permanent reduction of size. In the intervals between each *séance* compression should be maintained. Ligation of the external iliac and femoral arteries has often been resorted to, with a decided improvement or cure in some cases and a complete failure in others. Pyemia sometimes follows the operation, but recent statistics show a number of permanent cures. Leonard has shown that in sixty-nine cases upon which arterial ligature was applied, forty recovered and thirteen were benefited. Weber recently reported an interesting case of complete recovery following ligation of the femoral artery. Digital and instrumental compression of the femoral artery have also been followed by a reduction in the size of the limb. Nerve-stretching and excision of the sciatic have also yielded good results. Morton, of this city, excised a portion of the sciatic in a patient having the disease fourteen years, in whom the external iliac had previously been ligated without any appreciable effect, and the result of the last procedure, together with compression by a rubber bandage applied to the whole limb, was to lessen the growth to one-half its former size. The removal of the offending mass entire by the knife sometimes becomes necessary, especially when the genitals are involved. The amputation of a limb, which has been frequently performed, is not usually well borne by the patient.

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[1] Soc. d'Anatomie et de Physiologie de Bordeaux. Journal de Méd. de Bord., June 16, 1907, p. 377.

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[1] Ceylon Medical Journal, August, 1888.

[2] Lancet, February 16, 1891.

In a case of elephantiasis of the left leg just above the ankle, Dr. Raimundo Menocal, of Havana, secured a good result by excision. The disease appeared subsequent to a violent blow upon the foot. Just above the ankle were two extensive fleshy masses which had been in existence for about a year. A long incision was made over the anterior mass, the skin reflected, and the hypertrophied cellular tissue removed *en masse*. Under antiseptic dressings union by the first intention took place, and a month later the posterior mass was removed in a similar manner.

**Prognosis.**—It will be evident from what has been stated that the prognosis of elephantiasis may be regarded as not unfavorable. If the disease is seen early its growth may be arrested, and the same result may be reached even in the later stage by appropriate treatment or by operative procedure. It may persist throughout the patient's life, notwithstanding the best efforts, interfering with the movements and thus being a great burden and deformity. While it is at all times a dangerous disease and may have a fatal termination, yet the latter result rarely follows unless pyemia supervenes.

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[1] Atlas des Maladies de la Peau, 3$^{me}$ fascicule, 1889.

## DERMATOLYSIS.

SYNONYMS.—Elephantiasis telangiectodes—Cutis pendula—Fibroma pendulum—Pachydermatocele—Chalazodermia—Loose or relaxed skin.

Dermatolysis is a more or less circumscribed hypertrophied condition of the skin and subcutaneous tissue, as the result of which it may hang or be drawn out in loose folds. In some cases the skin is elastic and, when drawn out, becomes thinner than normal.

**Symptoms.**—This affection, which may be congenital or acquired, consists in a hypertrophy of all the structures of the skin. Attention has been called by Hebra to the low physical and mental development in subjects of this disease. It has been observed in several children of the same family, and is evidently due to congenital predisposition and shows a hereditary tendency. It appears in either sex, and although seen in adults, yet probably arises in early life or is congenital. Dermatolysis may be so slight as neither to be noticeable nor occasion the least inconvenience, or it may be so severe as to be both cumbersome and a great deformity. In slight cases the skin may be apparently normal in appearance, but soft, sensitive, movable, extensible, and at times elastic to the touch. A case exhibited in this city showed this form of hypertrophy over almost the entire surface, especially marked on the head, trunk, and extremities. This individual was, to all appearance healthy and the skin was apparently normal. To the touch, however, it was soft, sensitive, but not painful, movable, extensible, and exceedingly elastic. The skin could, for instance, be easily drawn from between the scapula forward over the back of the head, and from the sternum up almost to cover the face. When the skin was drawn out and held before a light, the circulation in it was well defined.

In the more or less severe forms of this disease the skin is thickened and tends to hang in rolls of various size, sometimes overlapping each other like the folds of a loose garment, or appearing like dewlap on the necks of cows. These folds of skin are generally brownish or brownish-black in color, rugous, but smooth and soft to the touch, appearing as if a distended, spongy substance had been compressed. Bell related a remarkable case in which the skin hung down from the ears, neck, the trunk, and abdomen, the subject being compelled to carry the masses in a tablecloth. Wilson, Stokes, Mott, Keen, and Piffard have also reported cases attended with unusual deformity. This form of hypertrophy may involve the whole surface, but it has been observed more frequently on the scalp, back, abdomen, and thighs. Molluscous tumors may appear on the surface of the skin.

There died at the London Hospital, April 11, 1890, a person known as the "elephant man"[1] who was extremely deformed in consequence of an extensive dermatolysis combined with congenital hypertrophy of the bones of the skull, right arm, and feet. There was no family history of any similar malformation. When a child, his skin was thickened, loose, and rough. As he grew older papillary masses developed on his skin, especially over the back, buttocks, and occiput. In some regions of the body heavy, pendulous flaps developed. In the later years of his life the enlargement of the upper jaw-bone and its overlying skin—the so-called trunk—rendered his speech difficult to understand. The head became so large and heavy that he was unable to sleep in a recumbent position. Death took place unexpectedly, and it was supposed that while he was sleep his heavy head had fallen backward and dislocated his neck.

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[1] British Medical Journal, April 19, 1890.

In dermatolysis, the functional activity of the skin is unimpaired. The disease is limited to certain portions of the body, such as the face (perhaps only one side), the neck, the chest, the belly, and the genitals. It is never universal.

**Pathology.**—Dermatolysis is a local hypertrophy of the integument, especially the subcutaneous tissue. The veins of the affected parts are considerably enlarged and the fatty tissue increased. The elastic fibres are left intact, but the fibrous tissue of the derma undergoes, acording to Seifert, a myxomatous transformation (myxo-fibroma). The cause of the growth is unknown. It has been noted to be closely related to molluscum fibrosum, and at times occurs in connection with that disease. Fibrous tumors also may be present in large numbers.

**Treatment.**—Excision, when the disease is not too extensive, is the only method by which the mass can be removed, if this procedure is at all possible, or necessitated by the inconvenience or suffering of the patient. The galvano-cautery is useful when the disease is limited to a small area.

**Prognosis.**—This is usually good. The deformity and inconvenience due to the growth are the only unpleasant effects that arise from the disease. Excision sometimes affords satisfactory results.

## HYPERTRICHOSIS—SUPERFLUOUS HAIR.

SYNONYMS.—Hypertrichiasis—Polytrichia—Trichauxis—Hirsuties—Hairiness.

Hypertrophy of the hair consists of an abnormal or excessive growth of the hair.

**Symptoms.**—Hypertrophy of the hair, which is an increase beyond its normal limits either in number, thickness or length, may take place in two different forms. First, upon regions provided with hairs of considerable length, as the head, face, eyebrows, axillæ, chest, and pubes. Cases of this form of inordinate growth, which may be hereditary or acquired, are frequently observed, many curious examples having been recorded by various writers of ancient and modern times. In these cases the hair grows unusually, both in quantity and length, measuring, for instance, on the head of some women reported by Wilson, six feet, and in Leonard's case, over seven feet in twelve years' growth. This tendency to unusual growth of hair may exist in several members of the same family.

The second form is that in which an abnormal growth of the hair takes place either over the general surface, or locally on certain areas where it exists normally only in a fine, downy condition. Hypertrophy of the hair may be either hereditary, congenital, or acquired. Thus, Facinus has reported an infant entirely covered with hair at birth. Wilson relates a case, not congenital, of an unmarried woman thirty-three years of age, in whom the entire surface was covered with hair. Numerous instances of a similar growth are likewise recorded, as the renowned dancer Negreui, whose hair, after recovery from an acute disease, increased over three yards in length; and the case of Julia Pastrana, who had both a fine beard and a hairy body. The case of Shwe-Maon, the hairy Burmese, and his children, reported many years ago, furnishes a remarkable instance of hairy development being both congenital and hereditary. The palms and soles, the prepuce and glans penis, are never affected by this abnormal growth. Certain races also are said to be noted for their excessive hairiness, as the Aïnos of Japan; but Von Krusenstern and Habersham declare the extreme hairiness of these people to be exaggerated. Abnormal growth of hair may occur in both sexes and at all times of life. When it develops between the eyebrows, on the arms, and the face of women, forming a mustache or beard, considerable disfigurement and great mental annoyance follow. Hairs may sometimes in their growth take an abnormal direction within or without the follicle, especially upon the scalp, eyebrows, eyelashes, often in the latter situation turning in toward the eyeball, producing the condition known as trichiasis. Hairs may also grow abnormally long and pigmented on smooth and warty mother's marks, when they are called respectively nevus pilosus and nevus verrucosus. Hypertrichosis over the spine occasionally conceals a spina bifida.

**Etiology.**—The causes which give rise to an abnormal growth of hair are unknown. It is observed more frequently in those having a dark rather than a light complexion. An excessive growth of hair is also known often to attend sexual disorders in women, at the climacteric period, and during and after various diseases. For example, I have witnessed its appearance after fever. Cases have also been recorded of its occurrence in insane persons, those mentally disturbed, and on paralyzed parts in certain nervous diseases, and from nerve injury. According to Dr. Andrea Cristani, hypertrichosis occurs much more frequently among the insane than among the sane. Hypertrophy of the hair may likewise occur from any cause which determines more blood than usual to a part. Local inflammation, continued friction on a region, or the application of any irritating substance—powders, lotions, liniments, or poultices—are, no doubt, frequently the cause of an abnormal growth of hair.

**Treatment.**—A general abnormal growth of hair can not be either relieved or removed. Small areas, which generally occur on nevi and the faces of women, may be successfully destroyed or may be removed temporarily. The most rapid and radical means of eradicating the majority of circumscribed hairy growths, such as hairy pigmented moles, is by the knife, the operation generally being slight, and, when properly performed, little or no sign of it remains on the skin.

The best method of removing hairs from a large area is by the x-rays, the effect of exposure being to cause a falling out of the hairs.

The next best method is the removal of the superfluous hairs by electrolysis by means of a galvanic current. This was first contrived and recommended by Michel, and afterward successfully used by Hardaway, George Henry Fox, Piffard, and others. The apparatus needed for the operation is an ordinary galvanic (not faradic) battery[1] containing from six to fifteen cells, two electrodes, a sponge being on the positive, and on the negative a fine platinum wire, or a thin cambric needle inserted in a small holder, a lens, and a pair of good broad-blade forceps. The patient is placed first in a strong light; the needle, which is connected with the negative pole, is carefully inserted into the follicle by the side of the hair as far as the base, and the circuit is completed either by the patient touching the positive pole, or by applying it near the seat of the operation. The needle is allowed to remain a few seconds; decomposition of the tissue follows, which will be shown by the appearance of minute bubbles or froth at the point of entrance. Care should now be exercised to lift the positive pole first, so as to avoid breaking the circuit as the needle is removed, thus avoiding a shock to the patient. Caution should also be employed in introducing the needle, to avoid puncturing small vessels, as the bleeding which follows delays the operation and also leads to considerable swelling from the escape of blood into the tissue. If gentle traction after the operation removes the hair, the probability is that the papilla is destroyed, otherwise the needle should be reintroduced and the same process repeated. A certain amount of congestion, swelling, or a wheal, followed by a papule or pustule, may develop around the follicle. The time required for the destruction of each hair will vary according to the dexterity of the operator and the sensitiveness of the patient. In one sitting from ten to forty hairs may be removed; the operation is, however, very tedious, and extremely severe on the eyes of the physician, often necessitating the use of a lens. Further, the operation is not only trying to the physician, but it is also painful to the patient, especially when the upper lip or neck is involved, the pain extending along certain nerves, particularly the dental branches, causing the teeth to ache severely. The pain sometimes diminishes after repeated operations, as the parts become more tolerant of the action of the galvanic current. If judged advisable, on account of sensitiveness of the patient, the surface about to be operated upon may be covered with an ointment containing cocaine. This procedure has the effect of mitigating the pain to a certain extent. The large hairs should be removed first, and the operation repeated on the smaller ones. A simple water-dressing, or the application of the oxide-of-zinc ointment, will lessen within two or three days the congestion and swelling of the part. In order to facilitate the operation so that the bottom of the cul-de-sac may be reached without injury to the surrounding tissue, an instrument has been devised by Dr. Frederick J. Leviseur, of New York. A needle-holder is modified in such a manner that the needle can be inserted and fastened by screw arrangement in three different positions so as to form with the handle a right, acute, or obtuse angle. The operator stands behind the patient, holds the instrument like a writing-pen, and introduces the needle by a slight movement of the wrist. Dr. Morton Prince, of Boston, calls attention to the fact that imperfect methods or insufficient apparatus are responsible for failure of the operation or resultant cicatrices. The current should be neither too strong nor too long continued, and should invariably be measured by the galvanometer. He uses a fifty-cell Barrett chloride-of-silver battery connected with a subsidiary carbon-zinc battery of equal electro-motive force, and in the circuit are inserted the rheostat and galvanometer. He never exceeds three milliampères as measured by the Hirschman galvanometer, and thinks that a strength of one half to one milliampère is often sufficiently strong.

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[1] Heitzmann recommends the Leclanché battery, containing six large cells. He adds that the advantage of this battery is that it is painless; even the most sensitive person can bear it without inconvenience. Journal of Cutaneous and Venereal Diseases, November, 1885, New York.

Dr. Arthur Jamieson states that for several years he has been in the habit of treating this condition by means of a solution of the ethylate of sodium. He had observed that when applied to nevi and hairy moles the follicles were destroyed and the hair failed to be reproduced. He describes the case of an infant in whom a large portion of the face was covered by an overgrowth of long, dark hair. Upon several successive occasions, the child being under the influence of chloroform, portions of the hairy area were treated, the ethylate being rubbed thoroughly over the surface. The final result was very satisfactory, and the skin remained hairless and smooth. The author's experience on the application of this caustic has been to the contrary, the ethylate of sodium, while acting well, always by its deep penetration leaves more or less scarring of the skin.

An abnormal growth of hair may be removed temporarily by shaving, epilation, or by the application of certain caustics to the affected surface. Shaving, however, merely cuts off the hairs on a level with the skin, and leaves the stumps showing as black points at the orifices of the follicles; the skin also becomes somewhat rough, and a certain disfigurement remains. This procedure for women will not, therefore, be advantageous. Epilation, with or without the insertion of red-hot needles or acid into the follicles, is not only very painful, but the hairs grow with renewed vigor, and its constant repetition changes a smooth integument to a rough, discolored, and uneven surface.

Caustics or depilatories have been employed from ancient times for the removal of hairs. They usually have, as their main ingredient, either the sulphide of calcium, arsenic, sodium, or barium. One of these substances is made in the form of a paste with water, and applied with a piece of wood or bone to the affected area and allowed to remain about ten minutes, when it becomes dry and is quickly scraped from the surface. The parts are then cleansed with water and anointed with cold cream or sweet oil, and later the congestion may be still more concealed by dusting a mild powder, as carbonate of zinc or magnesium, on the skin. As the caustic paste or depilatory not only destroys the hairs on a level with the skin, but likewise partially within the follicles, and as no black points or hair-stumps remain, the operation is certainly superior to shaving. Again, shaving requires to be practised more frequently, usually every day or two, while it is necessary to use a depilatory only three or four days. Sulphide of barium and oxide of zinc are recommended as forming an efficient depilatory, and may be combined as follows:

℞ Barii sulphidi ..................... ʒiij. 12.
Zinci oxidi,
Pulv. marantæ ..................āā ʒij. 8. M.

The sulphate of strontium has been reported to be an excellent depilatory.

All depilatories should be employed with care, as their improper or prolonged use will set up inflammation, and often produce greater disfigurement than the superfluous growth of hair.

While thus briefly giving an account of epilation and the use of depilatories for the removal of an abnormal growth of hair, because people will demand and physicians will often be compelled to supply or use them, I wish in this connection to condemn the employment of both most decidedly. They relieve only temporarily, and eventually increase the growth, rendering the skin red and rough, and frequently produce unsightly marks and scars. Excision, radiation, and electrolysis are the best and only certain methods, under all circumstances, to practise.

## ONYCHAUXIS.

SYNONYMS.—Onychogryphosis—Hypertrophy of the nails.

Hypertrophy of the nail consists of an abnormal increase of either its length or thickness.

**Symptoms.**—Hypertrophy of the nail may manifest itself by an increase in its substance either in length, width, or thickness, or all combined and frequently with more or less secondary changes. The nail may, for example, grow unusually long, occasionally curving downward like a claw, or it may expand laterally, pressing into the tissue, developing inflammation, or what is known as in-growing of the nail, or paronychia. It is more usual in this latter condition, in which the internal angle of the great toe is involved, for the nail in front and lateral margins to curve inward. This form of hypertrophy frequently gives rise to irritation or inflammation of the adjoining soft parts, with pain that is often unbearable, swelling, suppuration, the formation of granulations, and occasionally leads to destruction of the tissue and necrosis of the bones, and, in rare cases, to a loss of the affected member, as the foot, or even to imperiling the life of the patient.

In others the nail may be thickened throughout, or in one or more parts, being more or less elevated from its bed, assuming the appearance of a cone or wedge, leading to great deformity, and often interfering with the movement of the limb except under great pain. When the finger-nails are affected, tactile sensibility is impaired, and the performance of fine work is rendered impossible. In addition to these variations in size and shape, the upper and lower surfaces of the nail may be more or less changed. The upper surface may be uneven, furrowed, ridged, lustreless, and partially or entirely discolored; being either streaked, opaque, white, yellow, yellowish-brown, or black. The under surface may be covered with epidermic scales, brittle, and dirty brown in color. The consistency of the nail may likewise be somewhat changed, being either thicker or thinner, harder or softer, or tougher or more brittle, than normal.

There are two other conditions of the nails which may be mentioned here in which the nail-substance is structurally altered. The first is termed *onychia,* or inflammation of the matrix, the syphilitic form being frequently attended with its characteristic lesions around the affected digit or in other parts of the body. The other has been named *onychomycosis,* and is due to the invasion of the nail-substance by vegetable parasites. A form of onychia to which confectioners are liable has been described by Dr. Poncet, of Lyons. The nail becomes dark-colored, dry, and brittle, and falls in the form of little chips. Recurrent attacks may lead to extreme deformity. The makers of candied fruits are particularly attacked. The cause is complex, and the action of sugar, acids, and heat, evidently co-operate to develop the disease. A cure depends upon cessation from work. The treatment is prophylactic. The hands should not be dipped in the sugar solutions, or, at least, should be carefully washed and the sugar removed from beneath the nails. When the disease is established, the patient should desist from work, and antiseptic remedies are recommended. The term *onychauxis* is also used to designate other abnormities of nail formation which sometimes occur, as, for instance, the growth of a double nail upon the same finger or toe, or is in unusual situations, as upon an amputated stump, or, as sometimes happens, upon the shoulder over the scapula. The talon-shaped deformity is known as *onychogryphosis.*

Hypertrophy of the nails may be either slight or marked, and may involve one or several or all at the same time. It may affect the nails of the fingers or of the toes, but is more common upon the latter.

**Pathology.**—The nail-substance which grows from the papillæ of the matrix becomes hypertrophied. On examination, the papillæ of the matrix, especially in severe and chronic cases, are found enlarged, with more or less hypertrophy of the entire nail-bed.

**Etiology.**—Hypertrophy of the nails may arise from many causes, occasionally being congenital, but mostly acquired. It occurs most frequently from neglected care of the nails and from injury to the member, particularly from pressure of coverings of the hands and feet, as from tight-fitting gloves, stockings, boots, shoes, and slippers. Hypertrophy of the nail may also develop as the result of certain local and constitutional affections. Thus, it occurs in connection with tinea, eczema, psoriasis, ichthyosis, syphilis, leprosy, lichen ruber, small-pox, scarlet fever, typhoid fever, consumption, rheumatism, and certain nervous diseases. According to Prof. Verneuil, diabetes mellitus predisposes to the occurrence of ingrowing nail. Old age constitutes a predisposition to hypertrophy of the nails. Pulmonary consumption is attended by clubbing of finger ends and increased thickness with curving of nails.

**Treatment.**—The treatment of hypertrophy of the nails will vary according to the cause and the condition of the parts. Internal remedies are indicated when it occurs as a result of other diseases. Arsenic, iron, sulphur, or their various salts, may assist in restoring the healthy condition of the matrix, and thus indirectly influence the nutrition of the nails. All sources of pressure upon the affected member or members must be removed. The growth itself may be partially or entirely removed by the knife, scissors, cutting-pliers, or the saw. The preferable way of locally managing hypertrophy of the nails on general principles is by paring the free end of the nail, avoiding scraping and filing, and by pressing back, with the blunt end of the knife, scissors, or a piece of wood or bone, the free margin of the skin at the base and sides of the nail. This simple procedure, with the application of a soothing or an astringent ointment about the base and sides—either the tin or lead oleate ointment being serviceable—will often suffice to relieve or cure mild cases. If the free edge of the nail be brittle, it may be protected by wax, gum, or some other mechanical contrivance. Salicylic acid is likewise of service applied in the form of an ointment. If vegetable parasites have invaded the nail-structure, the discontinuance for a time of water to the parts, and the use of either the mercurous oleate or copper oleate ointments, will speedily effect a cure. Severe or chronic forms often require more active measures, as puncturing the soft parts with a knife, or leeching them, or removing the offending mass, and afterward applying soothing lotions or ointments. Many severe cases, especially of in-growing of the nail, can, if seen early, be relieved by working in a small piece of absorbent cotton between the nail and skin-fold; the offending portion, which presses into the cutis, can thus gradually be elevated, and later cut off without entailing suffering.

TOE NAIL ULCER, often called in-grown toe nail, is a painful linear ulcer under the corner of the nail, generally of the big toe. It is attended by hypertrophy of the soft parts surrounding the nail. When this growth is excessive a portion may be removed by surgical operation, as practiced by the late Prof. Joseph Pancoast, by excising a flap from the side of the toe. This is preferable to the classic method of removal of the entire nail, and destroying the matrix at the root by applying caustic potassa, which is rarely necessary. The minor degrees of this deformity may be corrected by much milder means. A simple method consists in lifting the corner of the nail from the granulation tissue in which it is imbedded and placing beneath it a small compress of absorbent cotton, moistened with dilute hydrogen dioxide (1 to 4). This dressing is to be changed several times a day, until the granulations disappear. The thickened nail also should be scraped, so that the corner will not press into the flesh. The end of the toe may be drawn away from the nail by a narrow piece of rubber plaster encircling the toe. Manipulations may be made painless by application of cocaine (20 per-cent.).

Mr. E. J. Domville, of Exeter, England, recommends bathing the surface if granulations be present with a solution, ten grains (0.60 gm.) to the ounce (32 gm.), of cocaine hydrochloride, after which absorbent cotton can be painlessly introduced between the nail and inflamed soft tissues. If the cocaine solution be applied every other day for two or three weeks, the surface of the sore becomes hardened and may be readily removed without causing suffering. Dr. Patin reports favorable results from the use of gutta-percha, ten parts in eighty parts of chloroform. The nail having been thoroughly cleansed, the solution is applied with a brush to the interstices between the nail and the granulations. This procedure is repeated several times upon the first day and afterward at lengthened intervals. By the means just related the nail is gradually lifted from its bed, and can be removed without pain by the scissors. Dr. Hofmann, of Erlangen, after disinfecting the toe with a sublimate solution, slightly raises the edge of the nail and deposits a few drops of the solution of chloride of iron. The application is repeated in the same manner upon the second and third day. If suppuration occurs, the hardened scabs are removed by the forceps and the solution reapplied. The crust is again removed after the lapse of three or four days, and after a few such reapplications the nail has become soft and brittle and can be easily excised by the scissors or a dull knife. Another simple method of treating in-growing of the nail, which will not oblige the patient to relinquish his daily pursuits, is that practised by Dr. Pürckhauer, of Bamberg. The portion of nail imbedded in the soft tissues is painted with a forty-per-cent. solution of caustic potash. At the end of a few seconds the upper layer of the nail has become so soft that it can be scraped off with a sharp-edged piece of glass. The painting with potash and scraping are continued until all that remains of that portion of the nail is a scale as thin as a leaf of paper. This scale can be grasped by the forceps beyond the swollen soft tissue by which it is covered and removed by means of a pair of fine scissors. No further treatment is at the time necessary. If, when the nail is subsequently reproduced, pain again occurs, the corresponding portion of nail may be softened by the same procedure, and will not need to be excised. It will be observed, however, that the majority of cases of in-growing nails do not reach the physician until the inflammation is so great and the toe so swollen and painful as to interfere with locomotion and lead to restless days and nights. I find, even under such circumstances, that speedy relief can be afforded by cauterizing thoroughly the affected part, usually the internal angle of the great toe, with a crayon of silver nitrate or pure carbolic acid, after which the cotton can be used in the manner already indicated. This method of treatment is preferable to removing all or part of the nail, as it preserves the nail and is less painful.

**Prognosis.**—Appropriate treatment is, as a general rule, followed by the removal of the abnormal growth of the nail. In some congenital cases, and those of long standing, it is difficult to effect a cure. When occurring in connection with leprosy, ichthyosis, psoriasis, eczema, and certain other affections, it is necessary first to cure the disease before the nails can be restored to their normal condition.

# CLASS VI.

# ATROPHIES.

*(Atrophiæ.)*

## ALBINISMUS.

SYNONYMS.—Albinism—Congenital achroma—Congenital leucopathia—Congenital leucasmus—Congenital leucoderma.

ALBINISMUS is congenital absence of the pigment of the skin. It may exist either over the whole body (albinismus universalis), or be limited to certain parts (albinismus partialis). Individuals affected with universal albinism are known as albinos, and are met with among all races. The skin, hair, iris, and choroid of these persons are remarkably wanting in pigment. The skin is of a milky-white or pink shade, the hair over the entire body fine, soft, silky, and generally white or yellowish-white, and, in rare cases, red in color. The eyes are of a pinkish-red color, owing to absence of pigment in the choroid and the iris. They are very sensitive to the light, the pupils constantly dilating and contracting, with more or less constant motion, or partial rotation, of the eyeballs, or nystagmus, and winking, making sight rather difficult except at twilight, when the luminous rays become less powerful, when vision grows stronger. Albinos are generally short of stature, and are weak both in mind and body, being said to be especially predisposed to pulmonary affections.

ALBINISMUS PARTIALIS appears most frequently among the darker races, as in the negro, but it is occasionally met with among Caucasians. It occurs as one or more snow-white or pinkish patches, which are usually circumscribed, but which may be of every variety of size and form. They may exist upon any region of the body, but are mostly confined to the scalp, face, the dorsal surface of the hands, nipples, and the genital region. The patches are generally irregular in their distribution, but occasionally are symmetrical, and found along the course of certain cutaneous nerves. The hairs upon the patches are frequently white. The eyes are normal, and do not exhibit an absence of pigment. Negroes affected with this form of albinism are spoken of as pied or piebald. The skin where patches have been has, through a redeposit of pigment, been known in several instances to resume its normal condition, but this restoration is very rare. The patches usually remain unchanged throughout life, or gradually extend until a large surface becomes covered and additional patches make their appearance. The cause of albinism is unknown. It is due to defective development of the cells connected with pigment deposit of congenital character, and it is said to be sometimes hereditary. By Wilson, the cause of the disease is referred to the nervous system.

## VITILIGO.

SYNONYMS.—Achromia cutis—Acquired leucoderma—Acquired leucopathia—Acquired achroma—Acquired leucasmus—Piebald skin—Pigment atrophy.

Vitiligo is an acquired disease of the skin in which round, oval, or irregularly formed, sharply defined, smooth white patches develop, which incline continually to increase in size, and are usually surrounded by an abnormally yellowish or darkly pigmented skin.

**Symptoms.**—Acquired leucoderma usually occurs between the ages of ten and thirty years, but is occasionally seen in younger children. Cases have been reported as young as four years of age.[1] It is a rare form of skin disease in Europe, but is less where the colored races are more numerous, as in this country. The disease appears as one or more, irregularly circular, sharply defined, white spots, notable for their absence of pigment. The surface of these spots is smooth, not scaly, and neither elevated above nor depressed below the general surface of the skin. The sharply outlined spots are surrounded by an abnormally dark pigment, which gradually fades into the healthy skin. This surrounding pigmentation is almost a constant feature of the disease, and may exist to either a slight or a marked degree. In form the spots are generally round or oval, but they may be angular and irregular. In size, they vary from a small to a good-sized coin, and may be even larger. They may increase in size and numbers, and may finally coalesce, forming patches which may involve the entire region affected, or perhaps nearly the whole body. Their color is milky or pinkish-white, their tint varying, however, to some extent in accordance with their age. To the touch, the spots feel just like any adjacent normal skin, exhibiting neither anesthesia, pain, itching, nor any subjective symptoms. If hairs are present, they are well fixed in their follicles, and are in color sometimes normal, but are more frequently pigmentless. The disease may, as intimated, manifest itself upon all parts of the body, and even involve the hairs. The sebaceous and sudoriparous glands are unaffected. Vitiligo generally appears on the backs of the hands, the forehead, the scalp, and the trunk. The tendency of the disease is to assume the chronic form, usually continuing during the entire life. The spots may increase either slowly or rapidly, and new ones from time to time make their appearance, until a portion or the greater part of the body becomes affected. Marked disfigurement ensues from the disease, especially if the spots appear upon regions exposed, as the face, neck, and hands.

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[1] Crocker in "Diseases of the Skin," second edition, London, 1893, p. 413.

In some instances a symmetrical arrangement of the patches is observed, as upon both limbs and particularly upon both hands. Brocq speaks of having met with cases in which the lesions, almost perfectly symmetrical, occupied the face, neck, trunk, and extremities. In such cases of general distribution they are often especially well marked in certain regions, as the neck or lower part of the abdomen.

Cases sometimes occur in which patches of vitiligo appear on the backs of the hands and on the face every summer and disappear as winter approaches.

**Diagnosis.**—Leucoderma is employed to designate congenital, partial achroma. Albinismus is applied to universal, congenital achroma; and vitiligo to acquired achroma, or leucoderma. The distinction is therefore arbitrary and clinical, and has not an etiologic or pathologic basis. Vitiligo is liable to be confounded with *leprosy* and *morphea*. In the last two affections, however, there is, in addition to the white spots, a structural alteration of the skin, and in leprosy it may also be anesthetic, while in vitiligo the only change observable is simply an absence of pigment in the patches, with an increase of the same material around their periphery. In the advanced stage, when the vitiligo has extended nearly all over the body, the remaining few pigmented patches might be mistaken for *chloasma,* but the history of the case will give a clue to the diagnosis.

**Pathology.**—There appears no other abnormity of the skin beyond absence of pigment in the white patches and increase of it in the skin immediately surrounding them. The texture of the skin remains normal. The lanugo hairs are bleached. Sensibility remains unaffected. Leloir has, in certain instances, found an alteration in the nerves of the affected region. In some cases there appears to be an unequal distribution of pigment, the color of the remaining portions of the body being darker than normal, which makes the contrast greater.

**Etiology.**—Vitiligo, which is a rare disease, occurs in both sexes and at all ages, but is most common in early adult life, particularly among brunettes and in the darker races, as the negro.

It is known to be a tropho-neurosis, caused by disturbance of general innervation, which may supervene upon both acute and chronic diseases. Dr. Mansel Sympson, of Lincoln, has described a case of vitiligo which occurred in a dark-complexioned English woman as a sequel to a severe attack of influenza, which was followed within a week by facial erysipelas. Soon after recovery from the latter affection small patches made their appearance, enlarged and extended. Vitiligo has been observed associated with hysteria, melancholia, exophthalmic goitre, neuralgia, and in consequence of severe shock. It has also been known to develop after strong mental excitement, and has occasionally followed an injury. It may follow herpes zoster, or a scald or burn, especially in the colored races. At times it appears among those apparently enjoying the best health, the cause of its development in these cases being unknown.

**Treatment.**—The Finsen and electric light have been used for this condition with good results. Douglas W. Montgomery, San Francisco, reported[1] a case of vitiligo, of marked character and extensive distribution, in an individual, nineteen years of age, of thirteen years' duration, which was cured by Finsen light therapy, administered with a London lamp. The treatment covered the period from April to September, and embraced nine sittings, with ten-minute exposures to a given spot. Prolonged exposure to sunlight would stimulate the deposit of pigment. All other treatment is practically of no value, there being no remedies at our disposal which will either remove or arrest the progress of the disease. It is suggested, in cases which appear to be clearly dependent upon a morbid condition of the nervous system, that treatment addressed to that disturbance may exercise a favorable influence upon the patches of leucoderma.

The Vigo plaster is particularly mentioned by Brocq. This is a preparation of complex composition, containing a considerable proportion of metallic mercury in association with storax, Venice turpentine, gum ammoniac, bdellium, olibanum, myrrh, and saffron, made up with yellow wax and simple plaster. In my experience, the many drugs which have been recommended, especially arsenic, have been entirely inoperative.

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[1] Journal of Cutaneous Diseases, January, 1904.

All local treatment is equally powerless upon the patches, but the surrounding yellowish or brownish pigmentation may be removed so as to lessen materially the disfigurement. Galvanism is suitable for this purpose, as well as the use of such remedies as the mercurials, phenol, acetic acid, the tincture of iodine, and the potash and soda soaps, alone or medicated. Various irritants have also been applied by friction to the patches in the hope of exciting a fresh deposit of pigment. Among these may be mentioned tincture of cantharides, or of capsicum, croton oil, turpentine, and spirit of ammonia. Sinapisms have been employed for the same purpose. The skin at the site of the lesion may be stained with walnut-shell juice or some pigment of the proper shade. The hairs may be dyed to correspond with those around them.

**Prognosis.**—The disease is only a disfigurement, and in no manner affects the health of the patient. It is generally regarded as an incurable affection. The patches tend to increase until they occupy a large surface. Occasionally, however, their growth ceases, and they remain stationary throughout life.

## CANITIES.

SYNONYMS.—Trichonosis—Poliosis discolor—Canities—Atrophy of the hair-pigment—Grayness or whiteness of the hair—Blanching of the hair.

Canities is a local or universal, partial or complete, loss of color in the hair (from *canus,* white).

**Symptoms.**—Atrophy of the hair-pigment may be either congenital, premature, or the result of advancing age. The congenital form is occasionally met with in albinism, the pigmentless, silvery, or silky hairs appearing over all the surface or only upon isolated parts of the body. The change in color may be slight, giving the hair-substance a gray appearance, or it may be more decided, the hair becoming silvery or entirely white. Atrophy of the hair-pigment may involve a part of a hair, or only certain segments of it, or the entire hair. Wilson reported a case which exhibited an alternation of white and brown segments from one end to the other of the hair. It thus presented the peculiarity of marking in the porcupine's quill. Dr. George W. Griffiths, of Louisville, Ky., has recorded a curious instance in which, after prolonged exposure to cold, the hair of a man, sixty-five years of age, was changed, within about one day, from white to black. Premature grayness or whiteness of the hair may be partial or universal. Again, the change in the color may involve hairs scattered through one or many portions of the affected part, or may involve only certain locks, or the entire part may be invaded. It is usual to see in advancing years a few silvery hairs scattered through the hair of the head or of the whiskers, or tufts of gray or white hair. Grayness of the whiskers usually appears first on those parts which have been most often shaved. Loss of pigment in the hair through age appears earlier in those possessing brown hair. It generally takes place first in a few isolated hairs on the temples. Sometimes the beard is the first part affected, and thence grayness spreads by degrees, until the scalp and the hairs upon all parts of the body become involved.

Occasionally a patch or tuft of white hair is hereditary. Dr. John H. Morgan met with a case in which a tuft of white hair grew from the middle of the forehead, and learned upon inquiry that the same peculiarity had been observed in members of the family during four generations. Similar observations have been made by Riggoli and Mr. H. N. Joynt, of Birmingham. Bourneville records a case in which alternate patches of black and light colored hair occurred upon the scalp. The eyebrows and eyelashes exhibited the same variation in hue. Premature atrophy of the pigment of the hair may come on at almost any period of life, and may take place either gradually or suddenly. The change in the color of the hair may be almost any shade, and may involve either a part or the whole of the hairy system. Flaxen hair may become chestnut, red, brown, black, or white; dark brown may change to red or light brown; black turn to flaxen, or become gray or white. Numerous instances are on record exhibiting such changes at various periods of life. Wilson[1] mentions several, and Smythe[2] and Prentiss also report cases of great interest, while I myself have seen in practice some, in which the change of color of the hair has been gradual. Dr. D. W. Prentiss has recorded[3] two cases in which the color of the hair was very remarkably changed by jaborandi, or pilocarpin, given hypodermically on account of uremia. The first was the case of a woman twenty-five years of age. Within about nine weeks, twenty-two injections were given, one-sixth of a grain at first and the quantity being subsequently increased to one-third of a grain. The hair had been originally of a light blond color, but during and after treatment it changed to chestnut brown, and then to almost black. The hue afterward returned to dark brown, which remained permanent. The second case was that of a lady aged seventy-two years, whose hair and eyebrows had been snow-white for twenty years. From twenty to thirty drops of the fluid extract of jaborandi were given several times a day for sixteen months. After the remedy had been used for about a year it was noticed that the eyebrows were growing darker and that the hair of the head was darker in patches. This gradual alteration of color progressed until death occurred. It is known that the plumage of birds may be varied in hue by the influence of certain articles of diet. Cayenne pepper is employed for the purpose of giving a rich orange color to canary birds. According to Dr. Sauermann, the effect is produced only in young birds before they moult. The change does not depend upon the pungent principle, but upon the coloring matter. The pigment is deposited in the egg-yelk as well as in the feathers. The experiments were carried out upon canaries, fowls, pigeons, and other birds. The Indians of the Amazon are said to cause green parrots to change to yellow and red by feeding them upon the fat of a certain fish allied to the shad. Dr. Elliott Coues is of the opinion that this change may take place in individual feathers, and is not limited to the newly produced feathers after moulting.

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[1] Wilson on "Skin and Hair," p. 108, Philadelphia, 1876.

[2] Arch. of Derm., July, 1880.

[3] Journal of the American Medical Association, Dec. 21, 1889.

Young persons, especially women, often call upon the physician and ask for some application to turn their hair again light or dark, as it was at one time. I have had two cases under observation: one a young woman who had beautiful blond hair, which gradually changed, following a severe fever, to a chestnut color; the other, a young girl suffering from general debility, who had light-brown hair, which slowly changed to a dark-brown. Sir James Paget knew a lady whose hair, during attacks of nervous headache, whitened in places, but regained its original color in a few days. The most annoying change is that in which the hair turns gradually or suddenly gray or white. This latter form of atrophy of the hair-pigment may come on at any period of life, and, while many cases are met with in the young, it is by far more common at adult age.

Premature grayness of the hair in most instances develops slowly, but a great many cases are recorded of the hair turning suddenly gray or white within a very few hours, or during the course of a single night. The singular circumstances may here be mentioned of the change of color in a cock's feathers from fear. From a beautiful black without a trace of any color the feathers of the head became entirely white, while on the back and neck about half had changed color, so that he presented a speckled appearance. Dr. Parry has described the remarkable case of a Sepoy prisoner whose hair turned white within half an hour from fright.

**Etiology.**—Premature atrophy of the hair-pigment may be caused by any one of the numerous internal derangements that have been referred to, and that give rise to alopecia. Cares, anxiety, severe wear and tear on life, prolonged mental strain, shocks, and all conditions that make a decided impression upon the nervous system, will bring about a gradual or sudden atrophy of the hair-pigment. Cases have been reported in which the cilia of the eyelids have become white in sympathetic ophthalmia after destruction of the other eye. Gray hair is caused by various severe diseases, as grippe, typhus or typhoid fever, erysipelas of the scalp, scarlatina, gout, and rheumatism. The use of certain forms of food and drugs, change in habits, seasons, and climate, and increase in age will produce atrophy of the hair-pigment. Arsenic or pilocarpin, given internally, has been proved to produce this effect, while a growing youth's hair often changes with age, habits, and seasons, being light in winter and darker in summer. A dark-haired person, in passing from a southern to a northern climate, may lose a certain quantity of pigment of the hair, which, of course, results in a change in the color of the hair. Various external injuries, applications, and agencies, as exposure to air and sun, make a most decided change in the pigment of the hair. Certain occupations influence, through chemical action, the color of the hair. Thus, among workmen in copper the hair may become green, and blue among those who labor in cobalt or indigo. According to Leloir and Vidal, children born of elderly parents whose hair has become gray are more predisposed to premature canities than their older brothers and sisters. Wilson, Pincus, Landois, and others have shown that the hair shaft in cases of sudden blanching contains gas, and supposed that this gas masks the pigment of the hair. This explanation, however, is inadequate: for though, if the pigment remained intact, its color would only be modified by the presence of gas, it could not be completely changed. The pigment granules must have lost their color. The gaseous matter can not be atmospheric air, but must arise from chemical alterations involving the destruction of the normal pigment. The decomposition is probably due to the formation, under disturbed nervous conditions, of destructive secretions in the generative apparatus of the hair at the root, and their passage by capillary attraction into the substance of the hair.[1]

**Treatment.**—Change of color in the hair may sometimes be arrested or concealed, in the case of young persons, by the use of suitable systemic treatment, as indicated for each individual case, and by the employment of such agents as will, to a moderate degree, color the hair-substance. Among the most useful applications for this purpose are the oil of walnuts, oil of chamomile, oil of eggs,[2] oil of mace and oil of cassia. A walnut hair-dye may be prepared by bruising forty parts of fresh green walnut peel with five parts of alum, and digesting with two hundred parts of olive oil until all moisture has been driven off, straining and perfuming.[3] A simple yet valuable agent is the ordinary sage, which is made into an infusion, and the hair frequently sponged and washed with it. Tannic or gallic acid, mixed with oil, glycerin, or lard, in the proportion of a drachm (4 gm.) of either acid to an ounce (32 gm.) of glycerin or lard, forms a most excellent preparation, that often decidedly darkens the color of the hair. If gray or white hairs appear, all that can be accomplished is to arrest, if possible, their rapid formation, and, when the patient wishes to conceal the loss of pigment, to recommend certain harmless agents which will permeate the hair and in a measure produce the effect of the lost natural color. The formation of gray or white hairs may be temporarily restrained by neutralizing the cause of them, by the application of any of the local remedies mentioned, or by plucking out the silvery threads. If the atrophy of the hair-pigment has become extensive, the hair, whether gray or silvery white, can then be concealed thoroughly only by dyeing the hair.

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[1] See paper by author on "Sudden Change of Color in the Hair," Medical Bulletin, April, 1891.

[2] The oil is prepared from hard-boiled yelks.

[3] Druggists' Circular and Chemical Gazette, March, 1891.

The proper application of hair-dyes requires an acquaintance with the nature of the agent employed; the skill to increase or decrease its strength according to the shade of color desired; and, lastly, dexterity in manipulation. Before using a dye the hair should be cleansed with soap and water or with a solution of soda or of ammonia, and allowed to dry for about one hour, after which the agent desired can be applied with advantage. The most lasting hair-dyes are the mineral ones, the vegetable dyes being often feeble in their action and uncertain in their effect, especially when employed by one unskilled in their application. Vegetable hair-dyes are usually considered less harmful, although some of them —as, for instance, pyrogallic acid, largely used—may produce justly alarming symptoms. The most valuable of the class already named is the Eastern or Persian combination of the powder of the dried henna-plant with the powder of the indigo plant. The two powders should be mixed separately with water and formed into a thick paste. The henna-paste is first spread on the hair, which develops, in the course of an hour, a red color, the indigo-paste being then applied in a similar manner. In the course of several hours the pastes are removed by water, leaving the hairs dyed a deep black. It is alleged by those who introduced this dye from Persia that, by means of regulating the proportion of the two ingredients, the length of time, and the degree of moisture, any shade of color of the hair that may be desired can be produced. Gawalowski asserts that ammonium anacardate, obtained from the fluid secreted under the pericarp of the cashew nut, will dye the hair a more or less dark color which is tolerably persistent. After the hair has been moistened by the fluid, it is combed with a comb which has been dipped in a solution of ferrous sulphate. An oleate of iron may be used instead of the sulphate. The anacardate may be also used as an ointment or mixed with oil.[1] Chrysarobin, goa, or araroba powder, one or two drachms (4 to 8 gm.) to the ounce (32 gm.) of lard, will give a dark-blue color to the hair. Pyrogallic acid communicates a dark-brown stain to the hair. This substance may be used as a pomade or in solution with eau de cologne and rose-water. The salts of iron produce a brown color.

The best and at the same time the most convenient, mineral hair-dye, to produce a dark-brown or black color in the hair, is the nitrate of silver, either in the form of a solution or of an ointment. I usually prefer a solution of silver nitrate, from fifteen to sixty grains (1 to 4 gm.) to the ounce (32 gm.) of water. After preparing the hair, as already described, the solution is applied. With a good-sized comb in the left hand, the operator lifts up the locks of hair, and with a soft, long-haired tooth-brush in the right hand, the dye is brought carefully in contact with the hair. The brush is moved up and down, rubbing the dye well in toward the hair-follicles, for, on account of the arrangement of the hair-cells, the silver oxide, as it decomposes from the menstruum, is thus better communicated to the hair-substance. The operator should endeavor to prevent the dye from coming in contact with the skin, and should hasten the process of drying the hair by rapidly fanning it. In case any dye should fall upon the skin, either fifteen grains (1 gm.) of potassium iodide, or thirty grains ( 2 gm.) of sodium sulphide, to the ounce (32 gm.) of water, or even a solution of sodium chloride, will remove it. Dyeing the hair requires from two to three hours' time. Evening is the best period for the operation, and the process will have to be repeated at intervals of from four to eight weeks, as the granules of silver oxide are mechanically rubbed off or otherwise lost, and near the roots white hair reappears. The length of time that the color will last largely depends upon the manner in which the operation is performed. In the same way another dye, a weak solution of silver nitrate (ten to fifteen grains (0.60 to 1 gm.) to the fluid ounce (32 gm.) of water can be used. After applying it, from one to two drachms (4 to 8 gm.) of potassium sulphide to the fluid ounce (32 gm.) of water are brought immediately in contact with the hair, forming, in combination with the nitrate of silver, a dark-brown or black color. Again, silver nitrate can be used with lead acetate. The dye can be applied in the form of an ointment, as follows: Silver nitrate and ammonia carbonate, each twenty to thirty grains (1.30 to 2 gm.); lard or simple ointment, one ounce (32 gm.) The best material for producing a blond hue is dioxide of hydrogen. Light shades of hair are also obtained by the use of rhubarb or turmeric.

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[1] Pharmaceutical Journal and Transactions, October 3, 1891.

**Prognosis.**—Premature canities is generally permanent. Occasionally the pigment returns to the hair, particularly when the affection has been superinduced by some acute disease, but instances of this reversal are, as a rule, rare.

## ATROPHIA CUTIS.

Synonyms.—Atrophia cutis propria—Atrophy of the skin.

Atrophy of the skin is characterized by a diminution in the thickness of one or more of its layers, or the absorption or degeneration of the tissues of which they are composed. It may be idiopathic or traumatic in origin, or may occur as a symptom in the course of various nervous and constitutional disorders. It may involve the entire surface, as in the senile form and in certain rare diseases. Senile atrophy may be regarded as the type of general cutaneous atrophy. The skin becomes thinner, lax, wrinkled, dry, discolored, and scaly, or the atrophy may be restricted to narrow lines and spots, as in the lineæ albicantes of women who have borne children. In simple atrophy there is a more or less uniform decrease in the size and number of the constituents of each layer of the skin. In degenerative atrophy the elements are altered in structure as well as diminished in number and size. General idiopathic atrophy of the skin is exceedingly rare. In a characteristic case observed by Erasmus Wilson the patient was a woman who had been in good health until her nervous system had been subjected to a severe strain. She then lost strength, and complained of severe pain in the left side, beneath her heart. In a few days her skin became sallow, and gradually hard and contracted, until it appeared to be too small for her body. Her fingers and toes were bent and distorted, and her lower lip was drawn away from her mouth, so that her teeth and gums were exposed. In a case described by Kaposi the atrophy was extensive, but not universal. The skin of the face, ears, neck, shoulders, and breast was perceptibly thinned, and so tightly stretched that some difficulty was experienced in raising it into folds. The surface was smooth in some places, and covered with furfuraceous scales in others. Sensibility was not impaired, and no subjective symptoms, other than a sense of tightness, was present. The affected skin was normal in color in some places, and yellowish brown in others. A few small, bright-red telangiectases were observed on the surface. The abnormal condition of the skin ceased abruptly at the level of the third rib. Below that point the skin was normal in all respects.

Johnson and Sherwell[1] reported a case of three years' standing, in which the disease first appeared on the anterior surface of the chest, subsequently developing at the root of the neck and over the scapula. The lesions showed a bead-like arrangement following the skin lines, corresponding in their distribution to the vascular supply. The authors attributed the lesions to a local interference with nutrition, due to obliteration of the smaller branches of the reticular plexus. The individual lesions were slightly raised and smooth. They were irregular in outline and sharply defined; there was no inflammatory areola. They were dead, white in color, the skin appearing as if spattered with white-wash. The older patches showed some scaling.

Microscopic examination showed the process to be one of pure degeneration, limited to the papillary layer, and to the upper part of the reticular layer. The elastic network covering the papillæ had disappeared. The rete was atrophied, but the horny layer was increased. The granular layer was absent. The sweat apparatus was not involved.

In Hardaway's case[2] the patient was a blind man, twenty-three years of age, of healthy parentage. His cutaneous malady dated from infancy, and his loss of sight from his seventh year. His face was rosaceous and scarred. The integument of the neck was pigmented in spots and reddened on the side, where numerous enlarged vessels could be seen. The front of the trunk presented a shining, checkered aspect, due to the alternation of pigmented spots with atrophic macules. The abdomen and chest were covered with cicatrices, and the umbilicus was stretched and elevated to the level of the surrounding skin. The skin around the elbows was pigmented and scaly. The skin and muscles of the hands were atrophied. The feet were normal, but the integument covering the legs and thighs was atrophied and pigmented. The entire skin, in fact, except that of the feet, was tense and atrophic. The hairs over the entire body were short and scanty. The cutaneous sensibility was normal, but the perspiratory function of the skin was imperfectly performed. There were no objective symptoms. Examination of the eye showed xerosis of the conjunctivæ, corneal opacities, and adhesion of the lids to the balls. Partial idiopathic atrophy has been occasionally observed. This form may be congenital or acquired and may manifest itself at any age. The affected areas vary greatly in size. A partial atrophy is one of the symptoms of facial tropho-neurosis. The lesions are circular or oval in form, pigmented, have ill-defined margins, and neighboring spots may coalesce. When the scalp is attacked the hairs become gray and fall out, leaving a patch of baldness. The patches of atrophy are irregularly distributed along the course of the trigeminal nerve, although exceptionally they have occurred upon the neck. In all the observed cases except one the manifestations have been limited to one side. Circumscribed atrophy of the skin occasionally follows infantile, or diphtheritic, paralysis or severe eruptive fevers.

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[1] Journal of Cutaneous Diseases, July, 1903.

[2] Transactions of the American Dermatological Association, 1884.

SENILE ATROPHY is due, as its name implies, to the changes produced by advancing age. It may be either simple or degenerative in character, but usually both forms occur together. The integument is thin, dry, and wrinkled, and presents a more or less pigmented appearance. All of the layers and structures of the skin are involved. According to Neumann, the rete Malpighii is thin, and its cells are shrunken; the horny layer is dry and brittle, more or less furrowed and easily detached; the corium is diminished in thickness, and the papillæ are absent or small in size. The subcutaneous connective tissue is usually devoid of fat. The pigmentary matter is brown or yellowish brown in color, and is distributed irregularly throughout the rete and the corium. Many of the hair-follicles either disappear completely or shrink considerably in size and depth. The hair-papillæ become flattened, the hairs are diminished in number and in size, and in many regions are entirely absent. The sebaceous glands undergo various alterations. The glands which are connected with the follicles of the lanugo hairs are usually either transformed into cysts (milium) or are completely obliterated. In some cases they are simply enlarged in size. The glands which are connected with the follicles of the large hairs are invariably found to be distended, and those which empty directly upon the surface of the skin are also enlarged. The blood-vessels are dilated and tortuous, and the muscular fibres undergo more or less granular degeneration. In some cases the entire substance of the corium becomes the seat of granular or of hyaloid degeneration. The sudoriferous glands do not exhibit any structural change.

In traumatic atrophy due to an injury of a nerve, all the tissues which are supplied by that nerve suffer to a greater or lesser extent. The muscles become thin and flabby, the subcutaneous fat disappears, the skin becomes thin, dry, and wrinkled. The integument is harsh to the touch, and usually presents a dull, lustreless yellow or brown appearance. The nails fall off or become brittle and distorted. The hairs also fall out, or become thin, dry, and brittle.

The condition known as glossy skin is indicative of impaired nutrition, and is usually the result of some lesion of the nervous system. It is observed as a sequence of obstinate neuralgia, or of an injury to a nerve-trunk, and may also occur in the course of progressive muscular atrophy. Ravogli saw it associated with chorea and epilepsy. It is attended with more or less burning pain, and is characterized by a smooth, glossy, pinkish, or reddish appearance of the skin, somewhat resembling that which occurs in chilblains. The hairs and nails of the affected region become involved and drop out, and the surface may become the seat of superficial fissures or excoriations.

The destructive processes of senile atrophy do not occur uniformly throughout the surface, but are more marked in some regions than in others. The patches may be treated with a saturated solution of resorcin in alcohol, several times a day. The Finsen light treatment may be serviceable.

The prognosis is unfavorable, as regards the condition of the skin; the general health may remain unimpaired.

## STRIÆ ET MACULÆ ATROPHICÆ.

SYNONYM.—Atrophic lines and spots.

There are two varieties of this form of atrophy, the idiopathic and the traumatic. The lesions of the idiopathic variety develop slowly, and without any apparent cause. They consist of irregular cicatriform streaks, lines, spots, and furrows, which are more or less depressed beneath the surrounding normal surface. They are soft and thin to the touch, and present a glistening, bluish-white, or pearly appearance when fully developed. The spots are round, oval, or irregular in shape, and vary in size from that of a pin-head to that of a finger-nail. The lines and streaks are of varying width, and may be one or several inches in length. The furrows vary greatly in depth and size. The spots are usually isolated. They may occur upon any portion of the surface. The lines and streaks are usually numerous. They are placed parallel to each other, and run in a more or less oblique direction. They may appear upon any portion of the body, but are most frequently observed on the buttocks, thighs, arms, legs, and abdomen. They may occur in either sex. These marks appear at any period of life, and are unaccompanied by any objective or subjective symptoms. They run a protracted course for many years. In what is sometimes termed the neurotic form of cutaneous atrophy the lines and furrows are developed along the course of one or more of the peripheral nerves. The minute, pearly, atrophic lines are the result of slight distention of the skin or of incomplete separation of the superficial rhomboidal bundles of connective tissue. The large streaks and furrows are produced by complete separation, followed by obliteration or absorption of more or less connective tissue. Kaposi has examined the lesions microscopically, and has found the epidermis, and especially the rete mucosum, to be much atrophied. The corium is greatly thinned, and the papillæ are absorbed or destroyed. The sudoriferous and sebaceous glands are more or less obliterated, the fat-cells are absent, the blood-vessels are few and contracted, and the connective and elastic tissues are much diminished.

In some cases, the lesions first develop as red, elevated lines, or spots, at points on the surface which are subjected to tension, but they gradually assume their characteristic atrophic appearance. The lesions of the traumatic variety consist of atrophic lines and furrows of various shapes and sizes. They may be produced by any cause which occasions extreme distention of the skin. They are most frequently observed in the abdomen of women who have borne children, as the result of abdominal distention during pregnancy (lineæ albicantes). They may be due, however, to distention through dropsy or obesity, to flatulence, or to the pressure of abdominal or other tumors. They may occur on the mammæ as the result of excessive distention of those organs during the period of lactation. They occur more readily in debilitated persons than in those who are robust. Ralleston reports[1] a case of remarkable striæ atrophicæ due to cachexia. Transverse lines of this description occasionally occur on the arms or thighs after an attack of typhoid fever in adolescence. Traumatic lines and furrows are due to rupture or disarrangement of the connective-tissue bundles of the corium. They do not give rise to any inconvenience, but usually remain without modification throughout life.

In this place may be considered certain skin lesions associated with the rapid growth of long bones. Northrup, at times, noticed about the knees certain scars which resemble closely the linæ albicantes, seen on a parturient woman's abdomen. Similar lines are described and the following explanation given by Jules Comby: "It is not rare to see a child present, as result of typhoid fever, a rapid and excessive growth. Such growth shows itself sometimes, besides elongation of the skeleton, in cutaneous welts (*vergetures*), having for their location the knees, and may occupy also other parts of the body." It literally seems that in some cases the skin cannot keep up with the growth of the bones, and thus the frayings result. The following description is given of the lesions: "They also are parallel, one just above the other, three or four in number. The lesions appear as large, intensely reddish or bluish welts raised above the surface. Apparently they remain stationary for a number of years, the evolution into whitish flat scars being a very gradual one."

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[1] The British Medical Journal, February 29, 1908.

## XERODERMA PIGMENTOSUM.

**SYNONYMS.—Atrophoderma pigmentosum—Melanosis lenticulares progressiva—Kaposi's disease.**

Taylor[1] and Duhring[2] have described a series of cases, under the name of "Xeroderma of Hebra," which can be most appropriately mentioned here. This affection is characterized by the appearance at first of a number of small, discrete, disseminated, yellowish, brownish, or blackish spots, similar in appearance to those of lentigo, found on the face, neck, trunk and extremities. After a time small telangiectases, or circumscribed aggregations of dilated capillaries, appear between or upon the primary lesions. Finally, the spots become gradually changed into smooth, whitish, glistening, cicatriform macules of various shapes and sizes. It appears to begin as a localized hyperemia, with dilatation of capillaries, leading to formation of telangiectases, which finally contract and induce atrophy of that portion upon which they are situated. McCall Anderson exhibited a boy who was the subject of this affection, whose sister had suffered from the same malady, and had died at the age of nine from some disease of the chest, the exact nature of which could not be ascertained. Hebra and Kaposi were the first to recognize this disorder. It generally begins at a very early age, upon the face and under the eyes, the general health being unimpaired. The disease progresses with periods of exacerbation and remission but no permanent amelioration. In a few cases no advance had occurred beyond pigmentation with slight atrophy, though it can never be positively affirmed that the malady shall not subsequently progress. The telangiectases and pigmentation may be regarded as a stage of hypertrophy. The disease occurs on both sides of the body, but is not symmetrical. The skin may become as thin as parchment and the follicles are destroyed. Incomplete stenosis of the nasal and oral apertures is apt to occur. When the atrophic process is at an end, no further pigmentation takes place. This disease leads to the formation of epithelial new growths, which may fall off and leave a surface which heals spontaneously, or it may be followed by an intractable ulcer, which becomes the starting-point of a new growth. Of the thirty-nine reported cases, malignant growths had developed in sixteen, and non-malignant growths in six. The period of greatest malignancy seems to be under the tenth year, though there is not much variation until the twentieth; after the twentieth year this unfortunate tendency diminishes. Unna, in fact, includes it among the carcinomata, and writes that "Xeroderma Pigmentosum is a typical carcinomatous disease." The disease is rare. Of the fifteen cases known in this country, ten involved members of four families.

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[1] Transactions of the American Dermatological Association.

[2] American Journal of Medical Sciences, October, 1878.

Dr. T. M. Rotch, of Boston, has recently described two additional cases under the title of "melanosis lenticularis progressiva," bestowed upon it by Pick and White.

**Treatment.**—The disease seems hitherto to have been entirely uninfluenced by treatment. From experience with Röntgen ray therapy in other diseases of the skin, I believe that this offers a promising method of treating these lesions and is worthy of a trial. Brocq thinks that in certain cases he has induced amelioration by the long-continued use of Vigo plaster. Early removal of the tumors is advisable.

## ALOPECIA.

SYNONYMS.—Calvities—Defluvium capillorum—Baldness—Falling of the hair.

Alopecia is a partial or complete falling out of the hair, from the scalp or other parts of the body naturally supplied with hairs, from any cause.

**Symptoms.**—Alopecia is not the name of a disease; but simply implies loss of hair, which occurs as the result of many diverse conditions. It may be either congenital, premature, natural, or circumscribed. Congenital baldness of the entire body, or of only a single part, is such a rare infirmity that, not being frequent, and seldom yielding to treatment, it will receive but a passing notice. Instances of persons being born without any hair are occasionally reported. Schede relates a case of an individual under his observation having no hair or sign of the follicles on the scalp. Neumann cites instances of certain species of the horse in Little Thibet, and of certain races of African dogs and hogs, having no evidence of hair on their hides. Some Chinese and Mexican dogs are free from hair. In the human family, congenital absence of hair is usually limited to certain regions, or the hair is deficient or scanty in its development. Paul de Molènes has reported a case[1] of congenital baldness in a girl, whose mother at nineteen and brother at six years of age had suffered from alopecia circumscripta. The interval being too long to permit the phenomenon to be ascribed to contagion, it was probably an inherited trophoneurosis. Under active stimulating treatment the hair gradually grew during three years until the scalp was covered, with the exception of a small patch behind the ear. Congenital alopecia is often associated with anomalies of the teeth and nails. It generally occurs as a hereditary condition. When the hair is lost after an acute attack of disease, it may be only temporary, a new growth taking its place, or it may be a permanent loss.

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[1] Annales de Dermatologie et de Syphililogie, 1890, i, 548.

PREMATURE ALOPECIA.—Premature loss of hair, either partial or complete, is so common, and occasions so much distress to all who are thus afflicted, as to demand from the physician, who may seek to check or to relieve it, the most careful consideration. It occurs, as indicated by its designation, in persons who have not reached an advanced age, and may be either an acute or a chronic affection. Sudden and rapid loss of hair, occurring in the course of from a few days to twelve or sixteen weeks, constitutes acute alopecia. It may or may not be attended by a change in the appearance of the hair (in syphilis the hair becomes rough, dry, and brittle), and inflammation or other cutaneous alterations of the skin may or may not supervene.

In some cases the scalp is not changed in appearance, and the hairs fall or are combed or brushed out daily to the number of from thirty or fifty to hundreds. The individuals so afflicted may or may not have neuralgic pains; most frequently no subjective symptoms are present. In other instances the rapid loss of hair is preceded or accompanied by an inflammation or eruption. Formation of crusts or scurf may be either slight or marked, and itching, smarting, burning, and even painful sensations may be experienced. Chronic alopecia, the most common form met with, may or may not, like the acute, be accompanied with primary or secondary changes of the scalp. At times, before or during the loss of hair, the scalp is affected with dry seborrhea or some other cutaneous disease. In very many cases, however, no alteration is apparent either in the general appearance of the hair or on the surface of the scalp. Alopecia usually begins long before the sufferer's attention is attracted to it by the concomitant of a lessening in the length of the hairs and their places being supplied by shorter ones. This first stage, in which the length of the hair decreases, may be observed by women, but rarely by men, unless they wear the hair very long. In due course of time this condition is succeeded by the second stage, in which, as Pincus truly describes it, the hair becomes thin, falls out, and is succeeded, not by hair having its original thickness, but generally by fine, short, and often downy hair. Even this downy hair may, in the course of time, drop out, and entire baldness supervene.

CHRONIC ALOPECIA usually begins at the vertex and extends forward on the frontal bone, and on each side, over the parietal bones to the pinna of the ear. Sometimes the loss of hair begins just above the forehead, and so spreads to the parts already named. It comes on so gradually as often to escape the most observant, until the second stage is reached, when baldness is almost certain to follow.

Senile Alopecia.—Natural or senile alopecia is due to an alteration and atrophy of the hair-forming apparatus. It is observed in old persons, and is caused through the agency of the changes that the cutaneous tissues have undergone. Senile alopecia begins generally on the crown of the head, where the scalp, not being so vascular as elsewhere, is in consequence easily invaded. It is usually preceded by the hair becoming short, thin, rough, dry, turning gray, and being cast off, slowly or rapidly, not to be restored. The hair upon other portions of the body may be cast off in a similar way, yet seldom is to the the same extent as upon the scalp. Pincus and Neumann have investigated the alterations in the integument of senile baldness, and found the change to be mainly atrophy of the follicles, sebaceous glands, and skin.

**Diagnosis.**—The diagnosis of the forms of alopecia just mentioned is simple; the only difficulty that may arise is the separation of one variety from another, and the recognition of the causative element in each case. It is, of course, important to be able early to distinguish between acute and chronic shedding of the hair. In the former case it will be noted that the shedding of the hair is usually diffuse and rapid, the hairs, on examination, not showing any evidence of disease in change of diameter toward the root-end or any change of color there; whereas, in the latter case, the very opposite condition is to be observed, the hair being cast off gradually, its loss often hardly apparent at the beginning, although the thickness is lessened and the color often altered. In the event of difficulty being experienced in distinguishing chronic from acute alopecia, the following method, described by Pincus in "The Laws of Hair Development," is a most certain way of detecting it: "On three days collect [the fallen hairs] morning and evening, and, if the hair be worn long, separate those over six inches from the shorter ones. If the number of short ones is one third of the whole, there is disease. If the hair be worn short, those hairs which bear traces of the scissors should be separated from the point-hairs, those whose terminal extremity shows no trace of the scissors. If the hair be worn four or five inches long, the number of those point-hairs must not exceed one-fourth or one-fifth of the general loss."

It is also necessary to be able early to distinguish between ordinary and syphilitic alopecia. In syphilis, the alopecia may be either slight or marked, and the hair is usually rapidly cast off, either in a uniformly diffused manner, or in patches having much the appearance of alopecia circumscripta. The previous history of the patient, the alteration of the hair and the scalp itself, and the concomitant symptoms, should all furnish a ready means of separating ordinary from syphilitic alopecia. According to Fournier, alopecia appears most often in asthenic cases of syphilis, in which debility is out of proportion to the usual syphilitic manifestations. It generally occurs between the third and sixth months, and in irregularly treated cases may be postponed until the second year. Syphilitic alopecia may be occasioned by syphilides of the scalp, though generally the hair falls without any obvious disease of the scalp. Alteration of the hair-bulbs has been found. Fournier states that this form of baldness is never permanent, but even in the absence of treatment the hair begins to grow again at the end of five or six months. When the eyebrows are attacked a characteristic appearance is produced, the hairs are left sticking out in all directions. Alopecia from favus is a form that should easily be recognized by the history, the presence of the crusts, and by the employment of the microscope.

**Pathology.**—In premature alopecia the pathology, as a rule, is at first identical with that of seborrhea sicca. The epithelial cells of the sebaceous glands and hair-follicles are shed; the nutrition of the hair is impaired—they loosen and fall. At a more advanced stage of the disease, the wall of the hair-follicle becomes the subject of an ascending hypertrophy, and the cavity is gradually obliterated from below upward by a new development of fibrous tissue. Finally, the derm itself undergoes atrophy; its muscular fibres are notably decreased, while its connective-tissue elements become more abundant. The coils of the sudoriparous glands are enlarged and the tubes are increased in diameter. The sebaceous glands are often enlarged during the early stage, but in the final stage may become atrophied. The subcutaneous connective tissue is considerably thickened and firmly attached to the derm by a species of induration. Neither the vessels nor the nerves appear to be altered.

**Etiology.**—Premature loss of hair is more common in men than in women, and this fact is no doubt principally due to the large quantity of subcutaneous fat in women. It is also owing to the attention that woman devotes to this, Nature's ornament, with which she is usually abundantly supplied, that she enjoys greater immunity than man from its premature loss. Women are more apt, through the fact of the length and the constant dressing of their hair, to detect the first inroads of the disease, and to apply at once suitable remedies. They are able, through the various methods of dressing the hair now in vogue, to conceal (more often the case than generally supposed) any and all evidence of thinning and baldness.

Premature loss of hair may be occasioned by both constitutional and local causes. Among the internal causes are the use of improper food by infants and growing children, as well as by youths and adults. Magendie showed that the feeding of dogs exclusively on cheese for a long time caused their hair to be shed. In a similar way persons who take poor food, especially one or two articles exclusively, or who feed on sweets, necessarily interfere with the hair-forming apparatus.

"The nervous system, which is one of the most important parts of the human organization, and which controls circulation, secretion, and nutrition, often plays a prominent part, if impaired, in the production of baldness. It has been demonstrated by modern investigation that defective action of the nerves of nutrition is often the cause of the thinning and loss of hair. The nutritive action of a part is known suddenly to fail, the hair-forming apparatus ceases to act, the hairs drop out until few remain, and the part becomes entirely bald. It is overtaxing of the physical powers, excessive brain-work, the exacting demands made by parents and teachers upon children's mental faculties, the loss of sleep, incessant cares, anxiety, grief, excitement, sudden depression and exaltation of the spirits, irregular and bolted meals, the lack of rest, recreation, and the abuse of tobacco, spirits, tea, coffee, and drugs of all forms, that are fruitful sources of this defective action of the nerves of nutrition and of general thinning and loss of hair."[1]

Bulkeley and Janeway[2] found that there were, among 15,240 miscellaneous dermatologic cases in private practice a total of 1,129, or over 7 per cent., which belonged to the group of affections of the hair caused by derangement of nutrition and innervation going on within the follicle. An analysis of such notes as were kept of them presented many striking features illustrating the points considered in regard to nutritive and neurotic disturbances of the hair.

Among other sources may be named debility, anemia, syphilis, irritation of the gastro-intestinal canal, impoverished blood, and the strain and exhaustion attendant upon the presence of any disease in the body. A symptomatic baldness often follows attacks of serious disease, irrespective of the scalp having been the seat of an eruption. It occurs after childbirth, typhoid and typhus fever, and frequently takes place in convalescence from the eruptive fevers, especially scarlatina.

A remarkable case was reported by Schloffer[3] of a tumor of the hypophysis cerebri; the symptoms being intense headache, anemia and the disappearance of all the hair of the body except a little on the pubes and chin. An operation was performed and the greater part of the growth of the hypophysis was removed. A histological examination proved it to be an adenoma. "An interesting and curious phenomenon was the effect of the removal of the hypophysis upon the growth of the hair. Shortly afterward, the hair began to grow everywhere." The hypothetical explanation given was that hyperfunction of the gland, by disturbing nutrition, interfered with the growth of hair, and the excision of the hypophysis removed the influence deleterious to hair growth.

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[1] Extract from the author's paper on "Hair; its Use and Care." Transactions of the Medical Society, State of Pennsylvania, vol. xv.

[2] L. Duncan Bulkeley, A.M., M.D., and Henry H. Janeway, M.D., New York City: "Nutritive and Neurotic Disturbances of the Hair;" Journal of the American Medical Association, July 25, 1908, pp. 279-285. Read in the Section on Cutaneous Medicine and Surgery of the American Medical Association, at the Fifty-ninth Annual Session, held in Chicago, June, 1908.

[3] Wiener klinische Wochenschrift, 1907. Review by Charles H. Frazier, Progressive Medicine, March 1, 1908, pp. 26 and 27.

In some cases alopecia develops without any assignable cause, and often, in such instances, it will be found that the individual inherits weak and poorly developed hair, and that the affection is hereditary baldness, derived from one or the other of the parents. The local causes are likewise very numerous. For instance, it is often brought about in both men and women by pressure interfering with the circulation, from some head-covering, as by the constant wearing of some form or other of the modern hats or bonnets. The improper use of combs, brushes, rubbing or scraping the parts roughly with one or the other of these articles, or the too frequent application of toilet preparations may promote the affection. Dyeing the hair, constant shampooing and close cutting, in men, are likewise factors in premature loss of hair. Both sexes and individuals of all ages contract alopecia from large quantities of dust commingled with gaseous products floating in the air of factories and workshops. The too frequent use of water on the scalp and other hairy parts of the body, especially of soapy water, or of water used in the form of a shower-bath, often causes irritation of the glands of the skin and a consequent wasting of the hair. Local cutaneous affections, as seborrhea, eczema, and the ravages of animal and vegetable parasites, occasion loss of hair. Bernheim states that experiments have shown that white mice put into the combed-out hair-pads taken from women, become bald and rapidly lose their hair; so will rabbits into whose skin the fallen-out hair and dandruff have been rubbed; and similar results occur frequently in the case of human beings. The less hair a man has on his head, the more he goes to his barber to obtain relief from baldness. He is therefore exposed to the same injurious influences, while he simultaneously exposes others who may come in contact with the residues of his own falling hair and dandruff. The barber-shop is not the only source of infection, for in the lavatories of hotels, large office buildings, and public baths are found a chained comb and brush which are used from head to head. The affection may also be transferred from one person to another. In that variety of alopecia which occurs in consequence of seborrhea sicca, Malassez has described a parasite which he believes to be the exciting cause of the latter affection. This organism has been found only in the form of spores located in the horny layer of the epidermis, and entering the hair-follicles, but not penetrating beyond the orifice of the sebaceous glands.

**Treatment.**—It is important, before considering the use of drugs for the relief or cure of alopecia, to point out briefly the care that the hair requires both to check and prevent its loss. The general hygiene of the patient should receive careful attention, especially after fevers, or any other debilitating and exhausting affections. The exciting cause should be sought out, and the patient be treated with such remedies as are required. The general health should be promoted by exercise and the employment of preparations like codliver oil, bitter tonics, iron, quinine, nux vomica, strychnine, arsenic, and phosphorus. Minute doses of one of the mercurial salts often have a most beneficial effect in arresting the progress of ordinary alopecia. In cases of syphilis, either mercury, the iodides, or tonics are necessary. Local care of the hair is of the utmost value. It is essential that the hair, particularly that of the head, should receive marked attention. In reference to the use of coverings for it, I know of no better rules than those given in my chapter on clothing in "Household Practice of Medicine" (vol. i, p. 218, William Wood & Co., New York), in which I state that the head is the only part of the body so protected by nature as to need no artificial covering:—

"The stiff hats, so extensively worn by men, produce more or less injury. Premature baldness most frequently first attacks that part of the head where pressure is made by the hat. It is, indeed, a pity that custom has so rigidly decreed that men and women must not appear out of doors with heads uncovered. It would be far better for the hair if to be bareheaded were the rule, and to wear a hat the exception. Since, however, we can not change our social regulations in this respect, we should endeavor to render them as harmless as possible. The forms of hats that are least injurious are, for winter, soft hats of light weight, having an open structure, or pierced with numerous holes; for summer, straw hats, also of open structure.

"As regards the head-covering of women, the fashions have been for several years favorable to proper form. The bonnet and hat have become quite small, and cover but little of the head. This beneficial change is, however, in part counterbalanced by the weight of false curls, switches, puffs, etc., by the aid of which women dress the head. These by interfering with evaporation of the secretions, prevent proper regulation of the temperature of the scalp, and likewise lead to the retention of a certain amount of excrementitious matter, both of which are a prolific source of rapid thinning and loss of hair in women. False hair has likewise sometimes been the means of introducing parasites, which give rise to loss of hair and obstinate affections of the scalp.

"Cleanliness of the entire surface of the skin should demand attention, and that should be accomplished by water, the best medium of ablution. It is a well-known physiological law that it is necessary, in order to enable the skin to carry on its healthful action, to wash off with water the constantly cast-off scales of scarf-skin which, otherwise, mingled with the unctuous and saline products, together with particles of dirt coating the pores, also interfere with the development of the hairs. Water for ablution may be of any temperature agreeable to the bather, according to habit and the condition of the bather's health. Many chemical substances can be combined with water to rinse effete products off the skin. Soap is, however, the most efficacious of all for cleanliness, health, and the avoidance of disease. Soap combines with water to render these unctuous products miscible, and readily removes them thoroughly from the skin. The best variety of soap to use for bathing purposes is the hard, white soap, which escapes noxious qualities often introduced with coloring material, and can not evade detection of inferiority through the introduction of some perfume or medicinal substance. Ablution with soap and water should be performed once or twice a week at least, particularly ablution of the head and beard, in order to keep open the hair-tubes, so that they may take in oxygen, give out carbon, carry on their nutrition, and maintain the hairs in a finely polished and healthy condition. In using water on the scalp and beard, care should be taken not to use soapy water too frequently, as it often causes irritation of the glands and leads to the formation of scurf. It is equally important to avoid using daily on the head the shower-bath, which, by its sudden, rapid, and heavy fall, excites local irritation, and, as a result, speedy loss of hair. In case the health demands the shower-bath, the hair should be protected by a bathing-cap. The best time to wash the hair, for those not accustomed to doing it with their morning bath, is just before retiring, so that they may avoid going into the open air, or getting into a draught and taking cold. After washing, the hair should be briskly rubbed with rough towels—the Turkish towel, heated, being particularly well adapted to the purpose. Those who are delicate or sick, and fear taking cold, or being chilled from the wet or damp hair, should have rubbed into the scalp a little bay-rum, alcohol, or oil, a short time after the parts have been well chafed with towels. Oil is particularly serviceable at this period, as it is easily absorbed, overcoming the undue dryness of the skin which often follows washing.

"It might be well to add in this connection the advice that I have frequently given, when consulted by those taking salt-water baths, as to the care of the hair during and after the bath. If the bather is in good health, if the hair is normal, the bather can go into the surf and remain at least fifteen minutes, and on coming out should rub the hair well with dry towels. Women should permit the hair to remain loose until thoroughly dry, after which it can be advantageously dressed. It is, however, injurious to both men and women experiencing some wasting of the hair, to go into the surf without properly protecting it. Sea-water has not, as is often thought, a tonic action on the scalp; on the contrary, it often excites irritation and general thinning of the hair. Again, it is most decidedly injurious to the hair for persons to remain in the surf one or two hours, the hair wet, and the head unprotected from the rays of the sun. This latter class of bathers, and those who hurriedly dress the hair while wet, which soon becomes mouldy and emits a disagreeable odor, are frequent sufferers from general loss and thinning of the hair.

"An agreeable and efficient adjunct after ablution, already mentioned, is oil. Oil has not only a cleansing action upon the scalp, but it also relieves any rough or uneven condition of the hair, and gives it a soft and glossy appearance. The oil of ergot is particularly serviceable in producing these effects, and at the same time, by its soothing and slightly astringent action upon the glands, will arrest the formation of scurf and assist in checking loss of hair. In using oil, the animal and vegetable oils should always be preferred, as mineral oils, especially the petroleum products, have very poor affinity for animal tissues. Pomatum is largely used by many persons instead of oil, as it remains on the surface and gives a full appearance to the hairs, thus hiding sometimes the thinness of the hair. No harm, and no special good, will follow the use of pomatum containing pure grease, wax, harmless perfume and coloring matter. This preparation, however, is often highly adulterated, and, the fat in it decomposing, sets up irritation in the parts to which it is applied. I therefore generally advise against its use.

"The comb and brush are agents of the toilet by which the hair is kept clean, vigorous, and healthy. The comb should be of flexible gum, with large, broad, blunt, round, and coarse teeth, having plenty of elasticity. It should be used to remove any scurf or dirt that may have become entangled in the hair, and to separate the individual hairs and prevent them from becoming twisted and matted together. The fine-tooth comb, made with the teeth much closer together, can be used in place of the regular toilet-comb just named when the hair is filled with very fine particles of scurf, dirt, or when parasites and their eggs are present. It should, however, always be borne in mind that combs are only for the hair, and not for the scalp, which is too often excoriated by roughly pulling these valuable and important articles of the toilet through the scalp as well as the hair. The brush, with moderately stiff bristles, may be passed gently over the hair several times during the day, to brush out the dust and the dandruff, and to keep the hair smooth, soft, and clean. Rough brushing of the hair, with brushes having very stiff bristles or wires in them, is of no service, but often irritates the parts and causes the hair to fall out. The use of the so-called electric brush is injurious, as is also the attempt to remove dandruff by the aid of the comb and brush. The question now arises, should the hair be periodically cut? It may be that cutting and shaving may for the time being increase the rate of the growth, but they have no permanent effect either upon the hair-bulb or the hair-sac, and will not in any way add to the life of the hair. On the contrary, cutting and shaving will cause the hair to grow longer for a while, but in the end will inevitably shorten its term of life, by exhausting the nutritive action of the hair-forming apparatus. When the hairs are frequently cut, they will usually become coarser, often losing the beautiful gloss of the fine and delicate hairs. The pigment will likewise change—brown, for instance, becoming chestnut, and black changing to a dark brown. In addition, the ends of very many hairs will be split and ragged, presenting a brush-like appearance. If the hairs appear stunted in their growth upon portions of the scalp or beard, or gray hairs crop up here and there, the method of clipping off and singeing[1] with a taper, a candle, or piece of heated metal, the ends especially of the short hairs, of plucking out the ragged, withered, and gray hairs, will cause them to grow stronger, longer, and thicker.

"The hair of growing children should not be cut at certain periods of the year (during the superstitious time of full moon, for instance), in order to increase its length and luxuriance as they bloom into womanhood and manhood. This practice of cutting the hair of children is condemned by the distinguished worker in this department, Kaposi, who states that it is well known that the hair of women who possess luxuriant locks at the time of girlhood, never again attains its original length after having once been cut. Pincus has by repeated experiment determined the same fact; and he says, as to the general opinion that frequent cutting of the hair increases its length, that the effect is opposite to that generally supposed. He states that, upon one occasion, he cut off circles of hair an inch in diameter from the heads of healthy men, and from week to week compared the intensity of growth of the shorn places with the rest of the hair. The result was surprising to this close and careful observer, for, although in some cases the rate of development was equal in those places to that on the rest of the head, he never observed an increase in rapidity of growth.

"I might add that I believe that many beardless faces and bald heads in middle and advancing age are often due to constant cutting and shaving in early life. The young girls and boys seen daily upon our streets with their closely-cropped heads, and the young men with their clean-shaven faces, are year by year through this fashion having their hair-forming apparatus overstrained. I must also condemn the modern practice of curling and crimping, the use of bandoline, and all varieties of gum solutions, sharp hair-pins, long-pointed metal ornaments, and hair-combs, the wearing of chignons, false plaits, curls, and frizzes. The last four articles mentioned tend to cause congestion and headaches. Likewise, I protest against the use of castor oil and the various mixtures extolled as the best tonics and restoratives, as they are often highly injurious instead of beneficial."

The details of local treatment are important. For cleansing the scalp nothing is better than a good tar soap (which should contain about forty parts of birchwood or beechwood tar, to a soap mixture, sixty parts).

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[1] See paper by author on "Cutting and Singeing the Hair." The Medical Bulletin March and April, 1892.

The scalp should be shampooed with this daily for eight weeks, and subsequently, twice weekly, for the next month or two. The rubbing should continue for not less than ten minutes. The soap is then to be washed off with warm water and the scalp patted dry with a paper napkin; it should not be rubbed dry. An application is made after each shampoo of a stimulating antiseptic solution:

| | | |
|---|---|---|
| ℞ Mercuric chloride, (½ per cent.) | | 100 parts. |
| Solution of glycerin, | | |
| Cologne spirits | āā | 50 “ |

Apply with a soft piece of flannel and rub for five minutes. This is followed by a solution of betanaphthol in absolute alcohol (½ per cent.), to dry the hair. A hair oil or ointment should then be freely applied and rubbed into the scalp for five minutes.

In the use of local agents for alopecia, the aim should be the application of such as are indicated for each case. In many, local remedies of a stimulating and astringent nature are demanded, while in others soothing and nutritive agents produce the best effect. If the hairs are cast off and no appreciable change has taken place in them or in the scalp, the use of either balsam of Peru, tannate of quinine, cinchona, and naphthol, one drachm (4 gm.) of either to the ounce (32 gm.) of scented lard, is often attended with good results. In alopecia, Dr. Besnier advises that the hair be cut short, a mild sinapism or rubefacient be applied to the scalp, after which every five days the following lotion should be used:

| | | |
|---|---|---|
| ℞ Acid. acetici | f℥j. | 32. |
| Chloroformi | f℥iv. | 128. M. |

This preparation should be used cautiously, on account of its irritant properties. In addition to the lotion, the following pomade is employed every morning, the scalp having been previously washed:

| | | |
|---|---|---|
| ℞ Acid. salicylici | gr. xv. | 1. |
| Sulphuris precipitat. | ʒjss. | 3. |
| Petrolati | ʒv. | 20. M. |

Kaposi recommends a solution of green soap in alcohol, five drops of oil of lavender being added to each fluid ounce (32 gm.). Lassar advises that the scalp be washed every day with tar soap for ten or fifteen minutes and the latter removed by an abundance of water. After the scalp is thoroughly dried, he applies a lotion of corrosive sublimate. An ointment composed of the following ingredients may be applied:

| | | |
|---|---|---|
| ℞ Acid. salicylici | gr. xxx. | 2. |
| Tinct. benzoini | ♏ xlv. | 3. |
| Olei pedum tauri | f℥iij. | 96. M. |

If too much irritation is caused, an ointment of wool-fat or of purified petrolatum, may be substituted.

He esteems pilocarpine as of value in the treatment of baldness, and proposes the following formula: Pilocarpine hydrochloride, thirty grains (2 gm.); quinine hydrochloride, sixty grains (4 gm.); precipitated sulphur, two and one-half drachms (10 gm.); balsam of Peru, five drachms (20 gm.), and ox-marrow, twenty-eight drachms (112 gm.). If the hair falls or combs out in large quantities from some fever or acute constitutional disease, the physician should make an exception to the general rules upon cutting just described. Under such circumstances the hair should be cut short, and, in some cases shaved, several times, after which some one of the ointments or stimulating lotions already referred to should be well rubbed into the scalp several times a day. The application in addition of galvanism, alternating with the faradic current every day or two, will still further produce a stimulating action upon the growth of the hair. When the hair has attained an inch or two in length the terminal ends should all be singed every two or three weeks, to give increased activity to the hair-forming apparatus. If, however, the scalp should be covered with sebaceous secretions, the glands plugged up (which is often the case), the hairs dry and lustreless, the employment of stimulating oils, especially the oil of ergot and oil of eucalyptus, may prove of service. A very useful application for this condition is equal parts of the oil of ergot and the fluid mercury oleate, scented with oil of roses and verbena. A mixture of the oleate of iron with oil of ergot or any of the ordinary oils may likewise be used with advantage in this condition. Another valuable remedy, the quillaya saponaria, the soap-bark, I first pointed out in a communication in 1879.[1] The soap-bark can be used in the form of the fluid extract, or infusion, mopped over the surface several times daily. In case the affection persists, the employment of local galvanism, or faradism, by the sponge or brush, often assists in arresting the loss of hair. The following may be applied daily to the scalp with some friction:

| | | |
|---|---|---|
| ℞ Resorcini | ʒiij. | 12. |
| Fldext. pilocarpi | fʒiij. | 12. |
| Tinct. cantharidis | fʒiv. | 16. |
| Ol. ricini | f℥ij. | 64. |
| Ol. myrciæ | ♏ xx. | 1.30 |
| Ol. lavandulæ florum | ♏ x. | 0.65 |
| Alcoholis q. s. | Oj. | 500. |

If more decidedly stimulating agents become necessary, the application of remedies used in the treatment of the circumscribed form of alopecia may be employed.

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[1] "Loss of Hair," by the author. The Medical Bulletin, vol. i, March, 1879.

**Prognosis.**—Congenital alopecia can seldom be benefited; senile baldness is irremediable. The premature form may be checked or cured; the prognosis will, however, largely depend upon the duration of the disease and the exciting cause. Individuals with good habits, treated when the disease is early recognized, are often cured, or benefited. Alopecia sometimes, even under the most favorable circumstances, progresses to permanent baldness, notwithstanding our best efforts. The prognosis of old cases of premature alopecia is usually very unfavorable.

## ALOPECIA CIRCUMSCRIPTA.

**Synonyms.—Alopecia areata—Area Celsi—Pelade—Porrigo decalvans—Tinea decalvans.**

Alopecia circumscripta may be either a neurotic or a parasitic affection of the hair-forming apparatus, generally characterized by the sudden loss of hair over one or more circumscribed patches of various sizes and shapes, which may increase in size and leave a bald area, without any apparent inflammation of the skin. In most instances, the disease is confined to the scalp.

**Symptoms.**—Alopecia circumscripta usually begins in one or more isolated patches, each one appearing suddenly and alone, or simultaneously, or in succession, without any premonitory symptoms. It may attack any hairy part of the body, but its usual seat is the scalp, the beard, the axillæ, and the pubes. The disease generally first develops on the scalp of those persons who have been endowed with a luxuriant growth of hair, and, next in order, the beard, although the latter, and other parts of the body, are seldom invaded by it. On the scalp the hairs are cast out of the follicles without having been broken off beyond the skin. The loss of hair in spots spreads peripherally, and is often increased by the addition of other spots. The affection usually comes on very suddenly, often without the least warning, a person's attention being sometimes first attracted to it during the course of the toilet. The hair may thus be shed unnoticed. Occasionally the loss of hair comes on slowly—days, and at times weeks, passing by during the process of the shedding, until the bald spots are fully established. The patches may be circular, circumscribed, long or irregular in shape, and may vary in size from a small point to a very large surface, at times covering the entire scalp. They are usually from one to three inches in diameter, isolated, unilateral, well outlined, and, when once thus determinedly formed, they seldom increase. During the progress of the disease the patches occasionally spread, coalesce, assume all manner of shapes, and are either arrested or denude the entire scalp. Sometimes, in the former case, shedding occurs in other parts of the body, the hairs falling from the entire surface, as from the eyebrows, the eyelashes, the chest, and, in the case of the male sex, from the axillary and pubic regions.

The denuded patches are somewhat paler than the normal skin, or slightly raised, especially in the beginning, reddened, and studded with follicular openings. In some cases the skin is thin, smooth, polished, and the follicles closed, while in others a few straggling, poorly developed hairs are observed over the surface and around the margins of the patches. The hairs around the spots are usually loose, coming out on the slightest pull, until the falling out has been arrested, when they become firmly fixed in the follicles. The skin of the patches has either a normal or else a softish feel, and is characterized by a diminished, or a positive absence of, sensibility. These latter conditions, when present, follow the development of the patches. Itching is a symptom that may appear before or during the course of the disease. In the majority of cases, however, all subjective symptoms are absent, except the great mental annoyance which the disease causes, arising from contemplation of the bald spots.

When the disease is arrested, or restoration sets in, the patches become covered with light-colored, fine, woolly hairs, which are often, in turn, partially or generally shed, to be in time increased in numbers, thickness, length, and pigmentation, until normal hair covers the parts. This affection may seem to be entirely cured, and yet a recurrent attack may come and again denude the spots. The duration of the disease is variable, depending largely upon the age of the individual and the state of the system. Cures are sometimes effected rapidly, but sometimes weeks, months, and years succeed one another before a favorable change appears, and in some cases the baldness remains permanent.

**Diagnosis.**—Alopecia circumscripta is liable to be confounded with the other forms of loss of hair already described and with *tinea capitis* and *favus*. The sudden shedding of the hair in more or less isolated, smooth, bald patches and their gradual encroachments, and the absence of the circumscribed spots, are the most ready means of distinguishing this disease from the other varieties. *Syphilitic alopecia,* which is usually diffuse and rapid, might, of all the forms already mentioned, be most easily mistaken for alopecia circumscripta. The history of the case, however, the presence of seborrhea, as well as concomitant symptoms of syphilis on the scalp or some part of the integument, ought to enable it to be so easily diagnosed as to render impossible its being confounded with alopecia circumscripta. Alopecia circumscripta is to be distinguished from *ringworm of the scalp* by the suddenness of the onset in the former affection, its characteristic isolated, smooth, bald spots, and by the atrophy about the root-end of the falling hairs; while in the latter affection the disease begins and spreads gradually, the patches are filled with hair-stumps, scales, and often crusts, and the microscope reveals, instead of atrophied hairs, mycelium and spores. Alopecia circumscripta may be distinguished from *favus* by the absence of the peculiar yellowish crusts of favus and of all sign of inflammation, or of vegetable parasitic irritation.

**Pathology.**—The anatomical condition of the skin and hairs in this variety of alopecia has been examined by numerous investigators without yielding any satisfactory result in accounting for the morbid process. Rindfleisch reports, in the "Archiv für Dermatologie und Syphilis," a nodular swelling of the hair "between the hair-bulb, on the one hand, and the narrowest part of the follicle, on the other." This condition was shown by Kaposi to be found in other diseases, and to be producible by the mechanical extraction of the hair. Jamieson[1] examined a specimen of skin removed from a patient, and was not able to find any changes in either the follicles, glands, or tissue. A microscopical examination of a hair from the area, or from the margin of a patch, shows an atrophied condition similar to that observed in the normal loss of hair. The root-extremity of the hair, instead of being bulbous, as it is found in healthy hair, is attenuated and often markedly atrophied. The degree of this condition varies, of course, according to the stage which the affection has reached at the period when the hair is removed for inspection. In examining the hair still further, it may be found gradually dilated along the shaft and bulging just before terminating either in a split end or a hair-point. This swollen, ragged, or split condition of the hair is owing to the fact that it has not received sufficient nutriment. The bundles of cells, deprived of their natural stimulus, have separated and given rise to the condition described. The same change that time brings to the normal loss of hair has taken place prematurely from alopecia circumscripta. Some disturbance or impairment in the nervous system, no doubt, plays an active part in bringing about these changes in the hair, thus causing its sudden and unexpected loss. In many specimens Behrend and Besnier observed the appearance of an air space in the root of the hairs and the absence of the hair marrow.

**Etiology.**—Two forms are recognized, the neuropathic and the parasitic. The disease occurs in both sexes. Children, adults and old persons are equally liable to be attacked by it. Alopecia circumscripta often follows some nervous affection, as epilepsy and neuralgia. Sudden shocks and frights are also well-known causes of falling out of the hair.[2]

Dr. Cutler has described the case of a boy who, two weeks subsequent to a well-marked attack of herpes zoster on the right side of the neck and scalp, suffered from a rapid loss of the hair, in patches, on the affected side.

The affection may likewise arise from debility, during and after fevers, and from any severe illness. Mr. C. F. Williamson reports[3] a case which developed a few months subsequent to an attack of epidemic influenza.

Direct or indirect injury is also among the many causes that may occasion it. Dr. Pontoppidan, of Copenhagen, has met with a case in which partial alopecia appeared three weeks after removal of a glandular tumor from the left carotid region. The hair was spontaneously reproduced within a few months. Similar cases have been cited by Askanazy. Max Joseph has produced circumscribed fall of the hair in cats and Guinea-pigs by lesion of the cervical ganglia or section of certain nerves. Behrand, in repeating these experiments, failed to produce baldness by dividing the sympathetic in the neck. Besnier, Vidal, and others conclude that it sometimes arises from perturbed nervous influence and in others from parasitic agency. With this opinion H. Leloir agrees[1] after an analysis of one hundred and forty-two cases. He was able in ninety-two of these to study closely the question of etiology: thirty-six were obviously of nervous causation; in thirty-five the origin was obscure, no facts pointing to disorder of the nervous system, traumatism, or irritation of the scalp; in twenty-one cases a contagious element seemed to be present. The typical or specific form of alopecia circumscripta is of parasitic origin.

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[1] Edinburgh Medical Journal, March, 1879.

[2] Wiener medizinische Wochenschrift, July 19, 1884.

[3] Lancet, June 7, 1890.

Lewis Wickham, in a paper read at the fortieth annual meeting of the American Medical Association, states that the prevailing idea among French dermatologists is that there exist two distinct diseases called alopecia. One is a trophoneurosis, the other is due to a parasite which acts indirectly on the hair-papilla through the mediation of the nervous system. Wickham cites instances which he has himself observed in the wards of Hallopeau and Vidal in the Hôpital St.-Louis, and alludes to several epidemics in schools and among troops. The parasite has not yet been discovered. It is not claimed that the disease is highly contagious.

Sabouraud, who has spent much time and labor in studying the micro-organisms which infest the scalp, has announced some very interesting and startling conclusions. He discovered a microbe constantly present in the lesions of seborrhea, and believes it to be the specific exciting cause of that disease. By methods which he describes, the bacillus of seborrhea may be obtained from the oily secretion, stained, and identified. It is found in rounded masses in the upper third of the hair-follicle. The same bacillus affects the sebaceous glands of the scalp, where it causes falling of the hair, either diffuse, as in ordinary alopecia, or localized, as in alopecia circumscripta. He therefore regards the circumscribed form of baldness as an acute local attack of seborrhea. Sabouraud has detected the bacillus of seborrhea in sections of the skin in an early stage of alopecia circumscripta. These two diseases are, in his opinion, essentially identical. Furthermore, in his opinion, baldness is the result of the spread and coalescence of circumscribed patches, or, to use his own words, "The bald only become bald by a diffused process of chronic alopecia areata."

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[1] Gazette des Hôpitaux, June 30, 1888.

These views explain the origin of baldness and the relation between seborrhea and loss of hair. They ascribe a common origin to ordinary and circumscribed baldness, and give precision to the earlier hypothesis of parasitic influence. The bacillus to which Sabouraud attributes seborrhea had been previously recognized by Unna, who had looked upon it as the exciting cause of acne. This was due, according to Sabouraud, to the fact that the two organisms were found in association. While there is sufficient clinical evidence of the contagious character of alopecia areata to demonstrate the parasitic origin of one form of the disease, yet this lacks confirmation by experimentation with any of the parasites named as effective. Hyde states that no classical reproduction of alopecia areata has yet resulted from infection of the sound skin with pure cultures of the parasites alleged to be the cause of the disease.

Local alopecia has been observed in consequence of exposure to the Röntgen ray.

**Treatment.**—Attention to the general system is essential. The patient should have a generous diet, especially those forms of food that afford ample nourishment. Change of diet, as well as of air, and the employment of all measures, especially hygienic, to invigorate the nervous system, will be found most efficacious. The use of general and local galvanism is often followed by the most beneficial results. As this form of the affection may be traced to an imperfect condition of the nervous system, I usually endeavor, by the means already mentioned, and by proper medicines, to attack the latent source of the disease. The employment of such agents as arsenic, strychnine, phosphorus, quinine, iron, and codliver oil, preparations that have likewise been suggested for the treatment of the premature form of alopecia, will be found of great value. Radcliffe Crocker suggests the hypodermic injection of one-thirtieth grain (0.002 gm.) of pilocarpine into the scalp.

The local treatment referred to, when speaking of alopecia, can be used advantageously in mild cases of the circumscribed form of this disease also, especially if the surface of a patch be elevated and congested. Pale, smooth, and depressed patches demand more active stimulation—agents that will make a decided and quick impression. The most valuable of all remedies for strong stimulation, both upon and in the parts, is the ointment of mercurous oleate. Naphthol and sulphur iodide are both useful remedies, used either alone, ten to sixty grains (0.60 to 4 gm.) to the ounce (32 gm.) of lard, or combined, in the same proportions. An ointment containing one or two drachms (4 or 8 gm.) of resorcin or ten grains (0.60 gm.) of thymol to the ounce (32 gm.) may also [illegible]ially employed. Shaving the patches frequently, espe[illegible] covered with very fine hairs, will often [illegible] apparatus. Singeing the hair soon after [illegible] with a taper, or by means of heated meta[illegible] growth of the hair. The ointments just named can be employed at the same time. Turpentine, chrysarobin, cantharides, veratria, tannic or gallic acids are agents that can be used in the form of ointment with good result. Chrysarobin should not be used too frequently, and a strong preparation should not be employed at first. Ten to fifteen grains to the ounce of petrolatum, will produce a mild dermatitis. It should be rubbed into the patches every night for a week, and then discontinued to observe the effect. Massage is useful to increase the blood supply of the part. Stimulating or blistering agents are often of value, and among the most important are alcohol, the various spirits, essential oils, and acetic acid. The following can be used advantageously:

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|---|---|---|---|---|
| ℞ | Spiritus vini rectificati | f℥j. | 32. | |
| | Tincturæ cantharidis, | | | |
| | Tincturæ capsici | āā fʒij. | 8. | |
| | Spiritus rosmarini | f℥j. | 32. | |
| | Spiritus ammonii fort. | f℥j. | 32. | M. |

Cantharidal collodion, painted over the patches, if small, every week or ten days is often of advantage. If the spots are very large, or the entire scalp or surface be involved, other remedies not so active may be called into requisition. A useful lotion which I employ consists of:

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|---|---|---|---|---|
| ℞ | Ammonii chloridi | gr. xx. | 1.30 | |
| | Hydrargyri chlor. corros. | gr. x. | 0.60 | |
| | Aquæ hamamelidis dest. | f℥ij. | 64. | |
| | Spiritus vini rectificati | f℥iij. | 96. | M. |

Glacial acetic acid, painted over small patches from time to time, is also of service. Horand has found croton oil of value, applied long enough to produce vesication. The use of this agent demands circumspection. Besnier denies the value of electricity, which the author has found very serviceable, especially in the form of galvanism. Lassar, an advocate of the contagious nature of the affection, claims remarkable success from his plan of treatment, mentioned under premature alopecia. Pyrogallic acid has also been used with success in some cases. The expressed oil of mace is very popular in Vienna. The application of either simple or compound hot poultices are of the greatest value, particularly if a large part of the scalp be involved. A useful agent to add to a poultice so employed is mustard or capsicum. The retention of heat and moisture, either by a poultice occasionally applied, or by wearing constantly a wig over the denuded surface, hiding also the disfigurement, is often followed by the most happy results, especially in stubborn and long-standing cases.

The exposure of the patches to x-radiation, with proper precautions, has been found in Paris to be very effective in treating this disease in children. Owing to the possibility of the spread of this disease by contagion, children suffering with it, must be kept away from school, or, if in an institution, quarantined and isolated.

**Prognosis.**—Alopecia circumscripta is generally curable, but its course may be protracted into months and years. The age of the patient and the exciting cause are factors upon which an opinion should be largely based. As a general rule, young persons and adults recover their hair; the prognosis is not so favorable for those advanced in age. Continuous and long-protracted diseases, especially those of the nervous system, often leave, as has also been already noted, permanent baldness as a consequence of alopecia circumscripta. Mild, and occasionally severe, cases sometimes recover in an apparently spontaneous manner, from the system having again returned to healthy working order. The deformity entailed by the disease, especially if a conspicuous part of the body be involved, often leads to great mental distress, and it is only by persistent encouragement and the constant use of the remedies mentioned that a cure can in the majority of cases be hastened and made permanent.

## ATROPHIA PILORUM PROPRIA.

SYNONYM.—Atrophy of the hair.

**Symptoms.**—The hair itself occasionally undergoes atrophic alteration in its structure. It becomes changed in part or in all of its length, either by increase or diminution in diameter. In some instances the shaft of the hair is the seat at one point, or at irregular intervals, of small bulbous swellings, which have a dark or shiny appearance, and is liable to break off between and at these nodosities, leaving a ragged, brush-like end. This nodose condition occasionally results, through the collection of pigment in the swellings, in the hairs presenting alternately bright and dark color, giving a bead-like effect throughout the mass of hair, causing its great disfigurement. Atrophy of the hair of this form is more especially confined to the beard and mustache, but is occasionally met with on the scalp and other hairy parts of the body. It is usually described as trichorrhexis nodosa; and another condition, similar to it, is known as "piedra." The last-named affection, common in Colombia, has been investigated by M. Juhel Renoy, who has applied to it the name of nodular trichomycosis (*tricomycose nodulaire*). An affection of the hair has also been described under the same title by Dr. Patterson. The account of the microscopic appearances given by these two observers agrees very closely, though the results of their histological examinations do not precisely correspond. Dr. Juhel Renoy states that the nodes are formed by an agglomeration of very refractive spores glued together by a greenish-yellow material constituted by compact colonies of rods. The diameter of the spores is about one hundredth of a millimeter—larger, that is to say, than those of trichophytosis. The rods seem to have nothing to do with the mycelium which, in fact, is small upon the hairs as though atrophied, but develops rapidly in cultures. The parasite does not penetrate the interior of the hairs, but is wholly exterior. Cutting the hair short is a preliminary to successful treatment, but Dr. Juhel Renoy has not yet had sufficient experience to be able to recommend any particular parasiticide.[1]

Another variety of atrophy of the hair, generally known as fragilitas crinium, is characterized by a brittle and cleft state of a part or all the hair-substance, often within as well as without the hair-follicle. The hairs, more particularly those of the head and beard, are irregularly thin or flattened, rough, uneven along the shaft, at points brittle, breaking off and splitting up, often into several fibrillæ. When the alteration goes on within the follicle, the hairs may be curled up within it, and in consequence considerable irritation often follows in the integument, chiefly observable in the region of the beard and on the lower limbs. The atrophy may involve the hairs to either a slight or a marked extent. In case the latter condition supervenes, the poor growth, with its marked changes, produces great deformity.

**Diagnosis.**—The broken-off, cleft, and deadened condition of the hairs, with often attendant irritability of the surrounding integument, has occasionally been mistaken for *ringworm*. The history of contagion in the latter affection, the circular arrangement of the patches, and the presence of the vegetable parasite, discoverable by the employment of the microscope, will always serve, however, to establish the diagnosis of the latter affection, and distinguish it conclusively from the other.

**Etiology.**—Atrophy of the hair, producing many of the curious appearances that have been reported from time to time, may result from either constitutional or local diseases. Many cases, however, do occur that can not be traced to any assignable cause. It often follows from fevers, or from debilitating and exhausting conditions that affect the hair-forming apparatus. Phthisis, malaria, syphilis, and excesses of various kinds are prolific among the causes that bring about atrophic alterations in the structure of the hair. Among the local conditions that lead to it are seborrhea, eczema, the effect of the ravages of vegetable and animal parasites, and the unskilful use of applications to eradicate these affections. Atrophy of the hair also follows from the many local causes that have been already mentioned, that produce premature loss of hair.

**Treatment.**—The exciting cause, if any can be detected, should, if possible, be removed. Tonics and remedies that re-establish nutrition in the system are usually indicated. Codliver oil and small doses of arsenic trioxide, or sodium arsenate, are productive of much good. As a general rule, the persistent use of local means will lead to the best results. Plucking out the hairs or breaking off the diseased ends of the hair, if many hairs are not involved, and rubbing into them a ten-per-cent. ointment of mercury oleate, once or twice daily, will at times restore the hair to healthy growth. If a large number of hairs are involved, shaving the entire surface is generally recommended; but I prefer to clip off the affected ends, or, if necessary, the whole hair-shaft, and then to apply the ointment just suggested. If the greater part of the hair-shaft be the seat of bulbous swellings, or only the portion of the hair situated within the follicle be involved, I find that better results follow from cutting the hair very short, and then using the ointment, than from shaving. The ointment of the nitrate, or of ammoniated, mercury, thirty to sixty grains 2 to 4 gm.) to the ounce (32 gm.) of lard, are also good preparations to use on the affected hairs. The application of either purified wool-fat or suet, with a few drops of oil of chamomile, will often assist in restoring the hairs to their normal condition. I sometimes use with good effect:

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[1] Journal of Cutaneous and Genito-Urinary Diseases, September, 1889, p. 343.

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|---|---|---|---|
| ℞ Olei myristicæ, | | | |
| Olei anthemidis ................āā | fʒij. | 8. | |
| Hydrargyri oleatis fl. 10 per cent. .. | f℥ij. | 64. | |
| Olei verbenæ .................... | ♏ v. | 0.30 | |
| Olei rosæ ....................... | ♏ j. | 0.06 | |
| Olei ergotæ ..................... | f℥ijss. | 80. | M. |

The various stimulating remedies and combinations previously mentioned, for the treatment of the premature and circumscribed forms of loss of hair, will often be found advantageous to employ. The tincture of cantharides is, perhaps, the most efficient agent in the nodose form of atrophy.

**Prognosis.**—Young subjects, by persistent attention to the treatment, may cause sound and vigorous hairs to replace those previously diseased. Failure very often follows the best means and efforts to cure this distressing affection. The prognosis for persons of advanced years, and for cases of long standing, irrespective of age, is not favorable.

## ONYCHATROPHIA.

SYNONYM.—Atrophy of the nails.

Atrophy of the nails, or their absence, may be congenital or acquired. In the congenital form there is frequently asociated with this affection an imperfect development of the phalanges and an absence of hair. Acquired atrophy, or a deficient development or growth of the nails, may be caused by any local or general disturbance which may affect the matrix or the bed of the nail, as from an injury. Syphilis, fevers, and often hypertrophy of the nails, are sometimes secondarily succeeded by this kind of atrophy. Among other causes may be mentioned ichthyosis, tuberculosis, locomotor ataxia, and cerebral paralysis. Gay has seen it follow compression of the subclavian artery.

Atrophied nail-substance may undergo alterations similar to those described for hypertrophy of the nail, becoming changed in size, shape, consistency, and color. Thus, the nail may become both smaller and thinner, flexible, or brittle and easily broken; or soft, granular, and even present a worm-eaten appearance. The surface of the nail may be smooth and unaltered in appearance, or may be discolored, opaque, or yellow and fissured. Dr. Foxwell has described[1] the case of a girl, aged nineteen, in whom six finger and three toe nails had almost completely crumbled away, their remains feeling like pieces of parchment beneath the cicatricial-like tissue which had grown over them from the superficial layer of the matrix. In two fingers this cicatricial tissue alone could be detected. There was no history of any injury or ulceration nor, indeed, of any acute period of the disease. A form of atrophy is sometimes observed in the nails of children, the ungual matrix first becoming swollen and more or less painful, after which the nail is raised, breaks, and finally almost or entirely disappears. The affection is symmetrical and attacks progressively several of the finger-nails, and sometimes all of them.

**Treatment.**—The treatment of atrophy of the nails depends mainly upon the cause, which should first be removed, if that be possible. If the diseased nails are painful, or interfere with the occupation of the patient, the application of soothing ointments, as the zinc or lead oleate, will be beneficial, and the use of wax or gum, or flexible collodion, over the nails, as a protective layer, will be found most grateful. The nails may at times be benefited, and their healthy growth promoted by applications of either sweet oil, codliver oil, oil of cade, mercuric-oleate ointment, or mercurial plaster. When the condition depends upon chronic inflammation of the matrix, G. H. Fox has seen improvement result from repeated immersion of the end of the finger in a mixture composed of 10 parts each of chrysarobin, salicylic acid, and ether to 100 parts of collodion.

NUTRITIVE ALTERATIONS OF THE NAILS IN CONSTITUTIONAL DISEASES.[2]—The color, transparency, and lustre of the nails are a good index to the general state of the health. Anemia is as readily recognized in the pallor of the nails as in that of the skin and mucous membranes. In leukemia the nails assume a deadly white color; in chlorosis they generally become pale and sometimes exhibit nutritive changes in progressive pernicious anemia, becoming thickened, fissured and crumbling off at the free edges. Hemorrhage may occur beneath the nails in scurvy, and give rise to inflammation of the bed with subsequent loss of the nail. Falling of the nail is not infrequent in the course of diabetes mellitus. The accident may or may not be associated with perionychial or subungual inflammation. In some cases of diabetes, ecchymoses occur beneath the nail. Locomotor ataxia may be attended by spontaneous and intermittent falling of nails, unaccompanied by suppuration, or ulceration, of the matrix. A patient of Dr. Acland exhibited symmetrical trophic lesions of the nails produced, as was supposed, by Raynaud's disease. The nails are altered in Morvan's disease. They may be lost, reduced to small plates lying upon the stump of the finger, or assume the most fantastic alterations. Sometimes they are curved like talons. Again, they may be hard, thick, irregular, and present numerous transverse furrows. In multiple neuritis, Bielschowsky saw the finger-nails marked by transverse milk-white patches without other alteration. The microscopical examination seemed to show that the discoloration was due to the presence of air.

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[1] British Medical Journal, February 16, 1890.

[2] See "Diseases of the Nails," by John V. Shoemaker, A.M., M.D., in Journal of Cutaneous and Genito-Urinary Diseases, vol. viii, 1890, Nos. 96-99.

The periods of cyclical insanity are often registered upon the nails in the form of grooves and ridges; in some cases they resemble the ridged shells of mollusks. In a similar manner, the original attack and following relapses, in enteric fever, may be indicated by transverse ridges in the nail, as shown by Da Costa and Longstreth.

In acromegaly the nails participate in the enlargement of the fingers and may be changed in shape. Dr. De Sanctis has given the history of a case in which necrosis of all the nails of both hands appeared due to lesion of the central nervous system. Arnozan has described a case in which spontaneous fall of nails coincided with alopecia circumscripta. Spontaneous fall of the nails in a hysterical woman has been observed by Dr. Falcone, and Dr. J. Leslie Foley is cognizant of a case in which all the hair and every nail was lost in consequence of the alarm excited by a violent thunder-storm. According to Dr. Lancereaux, dystrophy of the nails is present in a large proportion of cases of chronic rheumatism. They become furrowed, if not thickened and scaly. The nails occasionally are cast off when no impairment of the health can be detected. A case of repeated spontaneous shedding of the nails has been narrated by Dr. Hilbert, who was himself the subject. The process occurred in September of four successive years. In the fifth year but one nail was shed. The general health had been good, and the reporter was unable to account for the nutritive disturbance.[1]

Dr. E. L. Standlee relates the case of a healthy woman attacked by typhoid fever. In the same month of the following year, after a redness of the fingers, extending to the entire body, accompanied by fever and vomiting, the nails loosened and fell off, desquamation occurred and the skin remained red for some time. This process has been repeated each succeeding year. A similar case has been related by Dr. Livius Fürst, in which the effect was probably due to disturbance of circulation by prolonged contraction of the fingers. The nails sometimes fall during convalescence from typhoid fever, while in other cases they exhibit alterations due to depressed nutrition during the febrile stage. They are frequently crossed by transverse bands or furrows. The portion which developed during the disease lacks normal thickness, is rough, dull, and white. An attack of typhus fever, likewise, leaves white bands or furrows upon the nails. They sometimes fall after scarlet fever or small-pox, while in other cases they are channelled by grooves. The pustules of variola occasionally form beneath the nail. During the early stage of fractures, the growth of the nail is retarded and is resumed as repair advances. White bands or furrows upon the nails occur in consequence of acute rheumatism and relapsing fever. In gout, the nails lose their lustre and polish, are apt to become fragile, and manifest a tendency to break and scale. Furrows may appear upon the nail after sea-sickness, diarrhea, and nervous exhaustion. In tuberculosis, the nails are often thick, curved, and clubbed. In scrofulosis they are sometimes deeply grooved, enlarged, and of a firm, horny consistence.

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[1] Dr. D. W. Montgomery, of San Francisco, described in the Journal of Cutaneous and Genito-Urinary Diseases for June, 1907, a case of hereditary and continuous shedding of the finger-nails.

A severe inflammation of the nail-bed known as *onychia maligna* is met with usually among children, and is considered by most authorities as a local infection with the bacillus of tuberculosis. A finger-nail is the general seat of the disease. The inflammation is preceded by more or less pain for two or three weeks. The bed then becomes swollen beneath the free border of the nail, the redness and swelling increases, and terminate in the formation of an obstinate ulcer, situated at first beneath the free border, but extending gradually backward toward the lunula, until at last the whole bed and matrix are involved. The ulcer is of a fungous character, bleeds easily, and gives rise to a very fetid, sanious suppuration. The nail is dry, brownish or black, and gradually becomes loosened as the ulcer advances to the matrix. The nail may fall in one piece or in fragments. In other cases, again, the nail may remain and even grow, although, as a rule, it develops badly as to form and directions. The nail is apt to assume a vertical position. Sometimes it becomes thickened or curved. The last phalanx acquires a characteristic, bulbous appearance. The integument surrounding the nail is hard, shining, and livid. The affection is not a very common malady, but is very obstinate and manifests no tendency to heal. It may continue for years and lead to suppurative lymphangitis and lymphadenitis. The phalangeal bone may become involved, but is not generally attacked.

*Onychia maligna* is, in all probability dependent upon a predisposition to tuberculosis, though the immediate exciting cause is often a traumatism. Dupuytren and St. Germain have subdivided this affection into scrofulous and syphilitic. Constitutional treatment is demanded. The nail-groove may be sliced off and the matrix scraped, or the nail may be entirely removed and the ulcer covered with either powdered nitrate of lead, bromide of potassium, iodoform, iodol, thymol iodide or europhen. (Isobutyl-ortho-cresol-iodide.)

The white spots so often seen upon the nails are indicative of depressed nervous force, whether the result of exhausting disease, dissipation, sexual excesses, overwork, or anxiety. A very unusual case has been related by Dr. Robert B. Morrison, of Baltimore. The patient was a young woman, twenty years of age, suffering from acne, very pale but in fairly good health, who had had no acute illness. The finger-nails were marked by white stripes stretching across the nails, which were smooth, lustrous, and in other respects well formed. The white bands had been appearing regularly for several months. They seemed to be due to air spaces within the nail.

In a few recorded cases, associated with rheumatism or typhoid fever, the entire surface of the nails has acquired a white hue.

The nails not infrequently suffer in syphilis. They may become involved at any time after the constitutional symptoms have been established. One of the earliest manifestations is separation of the nail, either in whole or in part. In another form, known as friable onychia or *onychia sicca,* the nail loses its polish and color, becomes dry, thickened and brittle, readily splits or breaks, its surface being rough and its free edge transversely ridged. In *hypertrophic onychia* the nail acquires an immense thickness, becomes grayish or yellowish, rough and furrowed. Other forms of alteration are occasionally met with in syphilis.

Dr. Charles J. White, of Boston, has described[1] the case of a young man who exhibited extensive alterations of the hair and nails. His general health was good. The condition was hereditary, at least seven men in four generations of his family having shown similar defects of the hair and nails.

Alterations of the Nails from Local Causes.—The local causes of diseases of the nails are (1) traumatism, (2) implication of the matrix or bed of the nail in some cutaneous disorder, and (3) the action of parasites. The nature of these alterations is described in the discussion of the various cutaneous maladies of which they form or may form a part.

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[1] Journal of Cutaneous and Genito-Urinary Diseases, June, 1896, p. 220 *seq.*

## CLASS VII.

# TUMORS.

(*Tumores; Neoplasmata.*)

## RHINOSCLEROMA.

RHINOSCLEROMA is a new growth of the skin, due to infection with a specific micro-organism, and characterized by the appearance of flat and somewhat elevated, sharply defined, isolated, or conglomerate tubercles, rounded prominences, or plate-shaped masses around the nose and adjacent parts.

**Symptoms.**—Hebra and Kaposi conjointly, in the year 1870,[1] first described this rare affection, which usually begins without pain or inflammatory symptoms, in the septum, or on the outer surface of a single ala of the nose. Occasionally the disease originates in the pharynx or larynx, and one case has been recorded in which it started from the hard palate. The growth, which is well defined and elevated above the normal skin, presents an uneven but plate-shaped surface, formed from the variously sized tubercle of which it is composed. In color, the tubercles and rounded prominences may be either of the tint of the natural skin, or of a bright or dark brownish red, intersected with dilated vessels, presenting a smooth, polished appearance, devoid of hairs and follicles. From the epidermis over them, which is dry and somewhat fissured, is secreted a viscid fluid that is converted into yellowish, dry, adherent crusts. The lesions are of great density, and to the sense of touch they feel like cartilage or ivory. The skin over the tubercles is not movable, and can be picked up between the fingers only by the growth. Pressure upon the parts develops a certain perception of elasticity and also more or less pain, which is about the only subjective symptom, except the impediment which the formation opposes to respiration. The portions of the skin adjacent to the growth remain perfectly normal, and are not affected with any inflammatory symptoms. The growth, as has been before mentioned almost invariably attacks the septum and alæ, and thence spreads to the mucous membrane of the contiguous parts, especially the upper lip. In a few instances it has been known to extend to the Eustachian tube, tongue, or lachrymal duct. Hebra cites, in this connection, cases in which the hard and soft palate, especially the uvula, the pharynx, and the true vocal chords were involved. As the disease, which always becomes chronic, progresses, there is little or no alteration in the sense of smell, the parts, however, become swollen, deformed, the caliber of one or both nasal passages narrowed, and at last partially or completely occluded, thus stopping respiration through those channels.

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[1] Wien. med. Woch., No. 1, 1870.

At an advanced stage, the growth affects the mucous membrane of the lips, and eventually the periosteum of the alveoli, even the alveoli themselves perhaps becoming involved. During the course of the disease the tubercles do not, as a general rule, undergo any change, but Zeissl reports a case in which ulcerative action was followed by the destruction of the tip of the nose, the right ala, and the left nostril. There are, however, at times, superficial excoriations which manifest hardness. If a portion of the growth be excised, or otherwise destroyed, the remaining parts will not suppurate or break down, but become coated over with a thin, brown crust, heal very soon, and rapidly reproduce themselves. The disease generally develops between the twenty-fifth and fortieth years of life, and appears to have no effect upon the general system. Inasmuch as the malady is not usually confined to, or exceptionally, may not originate in, the nose, Wolkowitsch prefers to entitle it *scleroma respiratorium*.

**Diagnosis.**—The diagnosis of rhinoscleroma is often rendered very difficult, owing to the great resemblance between it and lupus, syphilis, keloid, and epithelioma. The location of the growth, the change in the appearance of the nostrils, the elevated, dense condition of the tissues, experiencing pain on pressure, and the exceedingly chronic course of the disease, undoubtedly suffice to distinguish it from these affections. The absence of the spironema pallida (or treponema pallidum) in sections, would exclude syphilis, if the clinical history was not clear enough to make the diagnosis.

**Pathology.**—The pathology of the disease has been extensively investigated by Kaposi, Geber, Mikulicz, Frisch, Pellizari, Chiari, Cornil, Alverez, Paltauf, and Wolkowitsch. Kaposi, in referring to his examinations, adds that, on cutting into a tubercle of rhinoscleroma, one is surprised at the ease with which the knife makes its way, taking into consideration the hardness apparent to the touch. The cut surface is of a pale-red color, uniformly and finely granular, and bleeds moderately. He further states that the epidermis and the rete are normal. The papillæ are longer, their connective-tissue framework exists only in the form of a delicately fibrillated, small-meshed network. Their vessels are scanty and small. This network of the papillæ is filled with small cells, closely packed together, the cellular infiltration here and there extending deeply into the corium, being uniformly dense throughout the vascular stratum, and the papillæ also being crowded with cells. The cells are smaller, especially in the protoplasm, than the so-called granulation-cells. They are generally such as are met with in acute or chronic inflammation of the skin, and in places where a new growth of connective tissue is taking place. The nuclei of the round cells are small and refract light feebly, and are finely granular. The cells appear to be simply lodged in the delicate connective-tissue stroma of the papillæ and the upper layers of the corium, and can easily be removed by manipulation. They are, in addition, unimpaired, and have a sharp outline and distinct nuclei. The deep layers of the corium show a dense connective-tissue network. Vacuoles are likewise observed, and are due to hyaline degeneration of the larger cells. Kaposi concludes that the growth is most closely allied to the forms of small-celled or granulation sarcoma. Geber and Mikulicz, while they give the same anatomy for this growth, yet consider the affection a chronic inflammatory process. According to Wolkowitsch, the hair-follicles and sweat-glands are, or become, atrophied.

Von Frisch, Pellizari, Chiari, Cornil, Alverez, and other histologists, believe it to be parasitic in nature, and due to a peculiar bacillus, one and a half times long as it is broad. The bacilli are found encapsulated in a colloid substance, and usually in pairs or fours. They are found in the neighboring lymphatic glands, in the large cells of the neoplasm, and in protoplasmic masses.

**Etiology.**—The origin of rhinoscleroma is obscure, but it evidently depends upon the presence of micro-organisms. A micro-organism which appears to stand in a causative relation to the disease has been identified by von Frisch, Cornil, Alverez, Paltauf, and Wolkowitsch. By all these observers it is described as being very similar in form and size to Friedländer's pneumococcus.[1] Paltauf, however, succeeded in demonstrating certain differences in the mode of growth by which the two forms may be distinguished by cultivation. Inoculation experiments have not as yet succeeded. Pawlowsky, in 1890, however, proved that these bacilli are pathogenic for the lower animals. The disease prevails particularly within certain geographical limits, in eastern Austria and southwestern Russia, and generally appears between the fourteenth and thirtieth years of life.

**Treatment.**—The treatment of this affection, although very unsatisfactory, becomes a necessity in extreme cases in order to afford temporary relief in respiration. Occlusion of the nostrils may be prevented, and the growth kept in abeyance by the use of such caustics as nitrate of silver, caustic potash, and chloride of zinc, or by the removal of part or all of the mass with the knife. The employment of sponge-tents, alone or medicated, in the nostrils, is also useful. The growth returns in time, however, notwithstanding the use of these and other agents. Lang[2] reports a most excellent result in a case from the employment of, first, salicylic acid, externally and internally, and subsequently the local use of phenol. Simon relieved one case by means of a ten-per-cent. pyrogallic-acid ointment. Kaposi succeeded in destroying a large portion of the new growth by interstitial injections of salicylic and osmic acids. Doutrelepont has seen considerable amelioration take place in consequence of the use of corrosive sublimate made into an ointment with purified wool-fat. Removal by the knife followed by the use of the actual cautery or thermo-cautery has also, in some instances, seemed to produce amendment. The Röntgen ray offers a promising means of treatment.

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[1] See paper by Kaposi on "Pathology and Therapeutics of Rhinoscleroma." Internat. Klin. Rundschau, 1891, Nos. 30 and 31.

[2] Wien med. Wochensch., June 16 and 23, 1883.

**Prognosis.**—This is always unfavorable, as the growth generally recurs, even if removed. The disease becomes, of course, serious, if the obstruction of the nasal passages be sufficient to interfere with respiration. Dr. Lubliner has seen a case in which the lesions of rhinoscleroma almost entirely disappeared in consequence of an attack of typhoid fever.

## LUPUS ERYTHEMATOSUS.

SYNONYMS.—**Lupus erythematodes—Lupus superficialis—Lupus sebaceus—Seborrhea congestiva (Hebra)—Scrofulide erythemateuse.**

Lupus erythematosus is a new cell-growth of the skin, appearing in the form of one or more reddish, circumscribed, rounded, ovoid, irregular, and slightly elevated spots, covered with thin, grayish or yellowish adherent scales. The disease is not due to the tubercle bacillus but it is found frequently in tubercular patients. A superficial and a deep form may be distinguished. Two clinical groups are named by Kaposi, lupus erythematosus disseminatus and lupus erythematosus discoides. No part of the body is immune, but the disease most frequently attacks the face.

**Symptoms.**—The disease is encountered more frequently among women than men. It generally begins with one or more bright or dark-red, circumscribed, rounded, and somewhat elevated spots, which have a shiny look, and a centre that is paler or slightly depressed, or covered with a thin adherent scale. The small primary lesions may be in size from that of a pin's-head to that of a pea, and may be either single or multiple. If but a single spot appears, it develops by peripheral growth very slowly, the central depression at the same time enlarging and becoming more apparent. After the patch has attained the size of a small coin, the contrast becomes well marked between the somewhat elevated, red, advancing border and the central depression. The small single spot may, in the course of months or years, gradually attain a considerable size, covering, for instance, the entire cheek. When there are more spots than one they gradually approach one another and coalesce, forming one or more patches with well-defined margins. They usually exhibit a round or linear form, but may be irregular. Their configuration varies according to the part on which the morbid process appears. The bright or dark red color of the spots sometimes varies, they having also in some cases a translucent or gelatinous appearance. The slightly depressed skin within the peripheral margin has a white, shiny, almost cicatricial appearance, or else is covered with dry, thin, or greasy white scales, with or without yellowish-brown crusts. The elevated border also, which is from half a line to a line in breadth, has a firm feeling, is covered with similar scales or crusts, and the surrounding sebaceous glands are open and often filled with comedones. At times the orifices of the glands are obliterated and an appearance like that of milium is produced. The amount of scales varies very much, being great in some cases and small in others. Upon removal they are found to be attached to glands which frequently appear distended and patulous. After a spot has attained a certain size it may remain unchanged for months or years, but will eventually disappear, the border fading and undergoing the same atrophic change observable in the central part of the patch.

The morbid process may thus disappear entirely, and may leave either superficial or deep scars. When the scalp is involved it will cause permanent loss of hair. The affection may persist in repeated attacks, sometimes during life, upon portions not at first affected. The disease is therefore of exceedingly chronic tendency. Its usual seat is the face. The nose, cheeks, eyelids, and ears are generally first invaded; and then the scalp, the back, the vermilion border of the lips, the hands, the feet, and other portions of the body may become affected. When occurring on the bridge of the nose and the cheeks, the affection may, in form, resemble a butterfly or a bat with extended wings, and hence is sometimes called "butterfly lupus." In rare instances the disease begins upon the hands or feet, to which it may even be confined, though the lesions, as a rule, subsequently appear upon the face. The palms are seldom involved. Occasionally the arm and hand are affected. Erythematous lupus of the hands and fingers has been seen in women more frequently than in men. There are usually no subjective symptoms, the only annoyance to the patient being occasioned by contemplation of the effects of the disease in the scars or loss of hair that may take place. In some extreme cases there is a slight or severe, constant or intermittent, itching or burning sensation. The state of the health usually remains good, except in the more general form described by Kaposi, which is known as *lupus erythematosus disseminatus*. In this last variety the lesions are generally distributed over the body, even the mucous membrane of the gums and cheeks being sometimes invaded. The spots are in the form of nodules, show no tendency to spread peripherally, but increase by continuous cropping out of new ones among the old. In rare cases the disease covered the entire body. The patches go through the same changes just enumerated for the ordinary variety of lupus is accompanied by both local and constitutional symptoms, as edematous and painful swelling of the skin and tissues around the joints, and pains in the bones. There may be, also, a development of serous and hemorrhagic blebs, adenitis, and erysipelas, especially of the face, the patient sometimes passing into a typhoid condition, ending in death. In a patient of Dr. Hallopeau's the central parts of the patches, in place of being atrophied, were the seat of little wart-like projections. This is a feature which had never heretofore been described.

**Diagnosis.**—Lupus erythematosus is easily recognized, especially when the face is invaded, the diagnostic points being the location, the peculiar color and shape of the patches, the central scar, the absence of subjective symptoms, the chronic tendency, which should serve to distinguish it from every other skin affection. The diseases with which it is most likely to be confounded are lupus vulgaris, ringworm, eczema, and syphilis. From *lupus vulgaris* it is distinguishable by the absence of papules, tubercles, and ulcers, and by the involvement of the sebaceous glands, which are not affected in that disease.

Lupus erythematosus seldom appears before the age of puberty, while lupus vulgaris may develop during childhood. The former, usually, also involves the upper part of the skin, the resulting scar, if any, being superficial, while the latter extends to the deeper structures, and there is a tendency to ulceration and disfiguring cicatrices. *Ringworm*, particularly that of the face, with its advancing border, may at times look like lupus erythematosus; but its rapid course, the presence of vesicles and papules, hair-stubble, and the detection of the parasite by the microscope show its distinctive character.

Pustular and squamous *eczema* may likewise bear some resemblance to lupus erythematosus, but the course of the former, the itching, exudation, the absence of the scarring and characteristic scales ought to be sufficient to prevent all error of diagnosis. In *ochronosis*, pigment may be deposited on the nose and cheeks, in a butterfly-shaped patch as in Osler's case, but the discoloration is ebony black and is accompanied by alkaptonuria.

*Syphilis* is distinguishable from the disease under consideration by its history, course, its presence in other regions of the body, and by the absence of the thin, firmly adherent scales with their attachment to the sebaceous plugs. Sections, under the microscope, will not show the treponema of syphilis.

**Pathology.**—Investigations have shown that lupus erythematosus is a chronic inflammation of the cutis leading to its degeneration and atrophy. It was thought at one time that the inflammatory process originated in or around the sebaceous glands, which is often, no doubt, the fact; but in very many persons the disease may effect all structures of the skin, and may have its primary seat in any of them. Hebra was the first to point out the involvement of the glands as the most essential characteristic of lupus erythematosus. Neumann, Geddings, and, at a later period, Kaposi, by a careful study of the disease, not only confirmed Hebra's views, but, in addition, specified the successive steps of the inflammatory process. Kaposi and Thin have shown that the disease could also have its seat as well in the sweat glands as in the sebaceous glands. Geber, Stroganow, and Robinson assert, in addition, that the disease may have its origin in any of the structures of the skin. The microscopic examination of portions of skin, affected with lupus erythematosus, indicates some inflammatory changes of one or other of the component parts of the integument. The glands are thickened, both by an increase of connective tissue and by an accumulation of cells, externally and internally. According to Robinson, the blood-vessels are dilated, and the surrounding connective tissue is infiltrated with embryonic cells, the affected portion being filled with small-celled inflammatory new growth, acquired from both the vessels and the connective-tissue cells of the part. The cells are not collected in the form of nodules. Many of them undergo fatty or colloid degeneration. Nerve filaments are unaffected. The layers of the epidermis become atrophied. The changes take place in either the superficial or deeper parts of the corium, and the result is seen in the proliferation of the gland-cells developing seborrhea, and in the infiltration and desquamation of the epidermis. The course will, from this stage forward, vary in different cases, the inflammatory action sometimes terminating, absorption setting in, the integument returning to its natural state, without leaving any evidence of the disease upon the affected part. The tendency in most cases, however, is for the inflammation to cause degenerative changes, leading to atrophy of the affected tissue. The hair-follicles and glands may be destroyed, resulting in cicatricial atrophy of the part affected by the disease.

**Etiology.**—Lupus erythematosus, which is a rare disease, generally occurs as the result of a defective state of the general nutrition. It is no doubt met with occasionally in those who are in comparatively good health, but the majority of those affected are poorly nourished, chlorotic, or tubercular. While persons of all temperaments may be attacked, yet the disease is more frequently observed in those having light skin and hair, who are especially liable to an irritable condition of the sebaceous glands. A scrofulous or tubercular state will thus be seen to be a predisposing cause of its production. The bacillus tuberculosis, however, has not been found in the lesions, nor have inoculations with pieces taken from lupus erythematosus produced tuberculosis in animals. Kaposi has pointed out that a severe local seborrhea is, in some cases, the active cause of it. It occurs more frequently in women than in men, and rarely appears before the age of puberty. Malcolm Morris observed a case in which it followed the bites of mosquitoes.

**Treatment.**—The first indication is to counteract the constitutional impairment, if any exist, that has led to its development, and keeps up the process. There is no internal remedy that has special curative effect, but general hygienic attention, with a nutritive and tonic treatment and proper local measures, affords, beyond doubt, the best results. Brocq[1] summarizes the treatment as follows: In the superficial form, he advises change of climate especially to warm countries, as the disease is unknown in the tropics. The face should be protected from congestive attacks caused by food that is difficult of digestion, spices, and especially alcohol. Warm drinks only are given. Constipation should be treated by warm douches. Moderate exercise is advised. As an internal remedy, arsenic is used, gradually increasing the dose to 7 or 8 teaspoonfuls of a four-per-cent. solution, then gradually diminishing it again. Small doses of phenol may be used. The chlorhydrosulphate of quinine (7½ to 15 grains daily, in two doses) acts more especially upon the congestive form. Local treatment consists in scarification, followed by electrolysis, with solutions of quinine, copper sulphate or zinc sulphate. The high frequency effluvia from the static machine have the advantage of curing the patient, without causing disfigurement. Congestive attacks are allayed by applying zinc ointment, and spraying with warm water. When the inflammation has been reduced several plans may be adopted. (1) Compresses of flannel moistened with spirits of green soap are applied to the lesions. At the end of a certain time, varying according to the individual susceptibility, the soap is washed off with warm water and zinc ointment applied. An application is to be made every day until the skin is quite inflamed. (2) Salicylic acid (1-20) or pyrogallic (1-40) in ointment may be applied; or the same dosage in solution in collodion. The skin should first be asepticised, so as to avoid infection. This collodion is to be renewed every 48 hours. (3) After washing with soap, an application is made of:

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[1] Journal des Praticiens, March 9, 1907.

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| Phenol (crystals) | | 10 gm. |
| Alcohol, | | |
| Glycerin | āā | 5 gm. |

If this does not cause an inflammatory reaction, it may be substituted by a mixture of:

Phenol,
Chloral hydrate,
Tincture of iodine, equal parts.

If some points are slow in yielding, a few superficial scarifications will aid in the cure. In the deep form of the disease Brocq, in addition to the internal treatment just described, uses phototherapy, or the actual cautery to the edges of the lesion every two weeks. In the interval he applies Vidal's plaster. Arsenical pastes may be employed, if preferred. In all cases, the medication is to be changed as soon as the evolution toward a cure tends to stop. Codliver oil, alone or with iodine, iron, arsenic, and phosphorus, may be used with benefit. Iodized starch, as recommended by McCall Anderson, can be taken in teaspoonful doses in milk or malt. Iodoform has been administered by Besnier, in doses of from eight to fifteen grains (0.50 to 1 gm.) daily, with the effect of curing several patients. Potassium iodide or chlorate, in doses of from five to ten grains (0.30 to 0.60 gm.), three or four times a day, may be used at times with advantage. Radcliffe Crocker suggests that sodium salicylate may prove useful. It is also important to employ external treatment in order to cause absorption or destruction of the lupous patches. Great care should be exercised, in applying local measures, not to add to the disfigurement of the part occasioned by the disease itself. It should be remembered that, while the affection usually leaves, through treatment, scars, and sometimes telangiectases, it may disappear spontaneously, leaving the skin in its normal condition. The mildest methods should, therefore, first be exhausted in the endeavor to eradicate the disease. If more radical means be required, they should be continuously employed, and the moment the patch shows signs of yielding, by becoming pale and on a level with the surrounding integument, the milder applications should be resumed. Resorcin has been recommended, fifteen grains (1 gm.) to the ounce (32 gm.), applied once or twice a day, and the parts afterward covered with an India-rubber mask.[1] One of the most useful applications is the mercurial plaster. Salicylic-acid plaster has likewise proved efficient. The copper-oleate plaster I have used several times, with the effect of removing the patches. The various mercurial ointments are beneficial, but the ointment of oleate of mercury, of a five- or ten-per-cent. strength, has been found the most valuable. I have had the most satisfactory results from depleting the parts two or three times a week with a small needle-knife, and applying constantly to them the ointment of zinc oleate. Kaposi, Veiel, Squire and Vidal, speak well of manifold scarification or puncturing, which has a similar effect to that just recommended. Sapo viridis is a valuable remedy, applied on a cloth to the patch or rubbed into the part once or twice a day, especially when the disease involves a part covered with hairs, as the scalp and the face. It can be used alone or with water, or, much better, mixed with an equal (or less than equal) part of alcohol. The thorough rubbing of the soap into the patch not only stimulates the part, but also removes all the scales, and cleanses the surface for any additional treatment. Zinc, bismuth, or ointment of lead oleate, or any simple ointment or lotion, may then be advantageously applied as an after-dressing. Chrysarobin, pyrogallic acid, or naphthol, in amounts of from ten to fifty grains (0.60 to 3 gm.) to the ounce (32 gm.) of some fatty substance, all form ointments that have been successfully employed. Phenol, applied in the form of an ointment, ten to twenty grains (0.60 to 1.30 gm.) to the ounce (32 gm.) of fatty substance, often proves serviceable. Tar and its preparations, used alone in the form of an ointment or mixed with alcohol or green soap and sulphur, has been found to do well in some cases. Sulphur, either alone or suspended in alcohol, glycerin, or some oily matter, acts sometimes remarkably well. Iodine is likewise especially useful, in the form of tincture, or as the glycerin of iodine, as recommended by Hebra and Anderson, or as the compound iodine ointment. A curious clinical observation was made by Hollænder, who reports that patients with patches of lupus erythematosus will show a reaction in these lesions, soon after the internal administration of quinine. From this observation he evolved a plan of treatment which has proved successful in his hands. He gives seven grains of quinine three times a day, and about ten minutes after the ingestion of the quinine, when the reaction of the lesions is observed, he paints the affected surface with tincture of iodine. This reaction he regards as pathognomonic and of as much importance in the diagnosis of lupus erythematosus as the tuberculin reaction is in lupus vulgaris. The treatment is kept up for six days, when a lamellar scab has formed. This will fall off in a week, when the treatment can be resumed. The treatment is kept up for weeks or months until a cure takes place. Quinine without the iodine appeared to do more harm than good. The application of the ointment of silver oleate has been attended with good results in several cases occurring under my observation. If the measures already detailed do not suffice, and the disease obstinately persists, more radical treatment will then be demanded. Pure phenol may now be applied with advantage, lightly pencilled over the surface, according to the indication, or a solution of caustic potash, one drachm (4 gm.) to two (8 gm.) of water. The latter application should be made with a piece of absorbent cotton or charpie, every three or four days, care being taken not to allow the lotion to penetrate too deeply into the parts, and to neutralize its action after the operation by pencilling diluted acetic acid over the surface. Glacial acetic acid, strong liquid ammonia, arsenic pure or in the form of the ointment of the oleate, zinc chloride, silver nitrate, chromic acid, sulphuric, nitric, and hydrochloric acids, the acid nitrate of mercury, and solution of sodium ethylate, are all valuable caustic applications, any of which may be employed, but always with great caution. In using these caustic remedies, the part should immediately afterward be dressed with some soothing lotion or ointment. Thymol iodide used in the form of a powder or as an ointment, constitutes an excellent dressing at this time, and as soon as possible recourse should again be had to the simpler remedies first mentioned, until the cure is effected. Erasion, with the dermal curette or spoon, has been successfully used by Dubin, Neumann, Auspitz, and many others, especially in some of the more obstinate cases. The actual cautery and the galvanic cautery have also been employed in many cases with the most beneficial results, the eventual scar often being very slight. Piffard resorts to surgical procedure in case the patch is small and conveniently situated, excising some of the surrounding healthy integument with the morbid tissue. The x-rays and the Finsen light have given good results in some cases, and have failed in others. In the deeper lesions the x-rays are useful adjuvants to other treatment.

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[1] British Medical Journal, May 15, 1886, p. 956.

**Prognosis.**—The prognosis of the ordinary form of this affection is good. The disease may be protracted, often becoming obstinate and apparently unyielding, or liable to relapses; but the ultimate result is the restoration of the part to recovery, usually with scarring or loss of hair. In the disseminated or general form of the disease the prognosis is not so favorable, many cases terminating fatally.

## LUPUS VULGARIS.

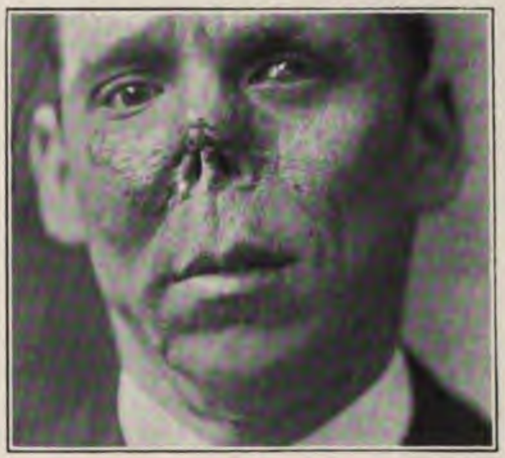
SYNONYMS.—Lupus exedens—Lupus vorax—Noli me tangere—Fressende Flechte—Esthiomène—Dartere rongeante—Scrofulide tuberculeuse.

There are four generally recognized forms of tubercular lesions of the skin, *i. e.,* (1) lupus vulgaris, (2) tuberculosis cutis orificialis, (3) scrofuloderma, and (4) tuberculosis verrucosa. There are also lesions occurring in tubercular subjects, or in persons predisposed to tuberculosis by inheritance, which have many common features and have been classed by Darier as "tuberculides." It has been suggested by Hallopeau and others that these are caused by the toxins in the blood (therefore, toxi-tuberculides), and not directly by the tubercle bacillus. The essential lesion is a small granuloma which gradually softens in the centre and discharges, leaving scars.

LUPUS VULGARIS will be considered first. This is a new cell-growth of the skin and adjacent mucous membranes, appearing in the form of variously sized and shaped reddish or brownish spots, consisting of papules, tubercules, or infiltrations, which are removed by interstitial absorption, or by ulceration, with much destruction of the soft parts, and with cicatrization. It is essentially chronic in its course.

**Symptoms.**—This disease commences with the appearance of many small discrete or grouped, reddish, brownish, or yellowish-red spots, from the size of a pin's-head to that of a pea or a bean, deeply seated in the true skin. These well-defined spots, situated beneath the epidermis, through which their color is observable, give to the skin a punctated appearance. In the early stages of the disease they are not sensible to the touch, which merely causes them to assume a lighter color. In the course of some months they slowly increase in size, and gradually approach the surface of the skin, until finally they become evident as papules and tubercles, through both appearance and palpation. They usually present themselves in large numbers and of sizes within the range already indicated. Their color is brownish red, with surfaces either rough or smooth, sometimes more or less covered with shiny, whitish epidermis. Through their mass, exteriorly and interiorly, they are permeated with small blood-vessels. The papules and tubercles may be either soft or firm to the touch, and are not painful. The lesions may, at this stage, remain discrete, or unite and form flat or

# PLATE XXI



Lupus Vulgaris. (Private case.)

(See page 682)

prominent infiltrations of greater or less extent, usually of a circular or serpentine form. A characteristic purplish or reddish patch, usually the size of half a small pea, constituting the lupous nodule, or lupoma, may exist without noticeable change for a period of many years. This patch is rather boggy to the touch, and when opened its contents have the appearance of a light-colored jelly. Having reached this stage of development, the lesions, sooner or later, undergo either absorption, leaving behind a desquamating and more or less atrophied skin, constituting what is known as lupus exfoliativus, or else disintegration and ulceration of the infiltrated skin occur (lupus exulcerens or exedens).

The lupoid ulcerations, which are painless, may be superficial or deep, and in appearance are usually flat, rounded, or irregular, with reddish, soft, but well-defined margins. There may be a moderate purulent secretion, with crusting, and when the base of an ulcer is exposed it is red, smooth, or covered with granulations, and easily bleeds. During the course of the ulceration, or as healing begins, papillary outgrowths may occur (lupus hypertrophicus), followed by more or less of warty, cicatricial tissue (lupus verrucosus). The forms of lupus just mentioned are merely degrees of one and the same process, which may be arrested or modified during its course, resulting in some special variety of the disease. The affection, however, frequently presents at the same time several kinds of lesions—that is to say, the same region may present various phases of evolution and involution of the malady. The disease, under such circumstances, presents a most striking and characteristic appearance, there being often, at one point, the small primary spots, at another papules and tubercles unchanged, or else undergoing the process of absorption or ulceration, with here and there scales, crusts, exuberant granulations, cicatricially atrophied spots, commingled with areas of unaffected skin. Lupus may occur upon any region of the body, but its common and favorite seat is the face, especially the nose, cheeks, and ears. It may appear also on the trunk and extremities, either in connection with, or independently of, the development on the face.

Besnier has seen lupus develop upon the site of a vaccinal cicatrix. It occasionally manifests itself also in consequence of a traumatism. Dr. Balmanno Squire has called attention to the fact that although lupus of the fingers is capable of completely destroying those members yet it spares the matrices and the nails. As the finger is shortened the nail remains intact at the end of the stump, and may finally recede to the level of the metacarpo-phalangeal joint, where it remains in an apparently normal condition. On the other hand, lupus, in exceptional cases, may be followed by or transformed into carcinoma. Two cases of this kind have lately been published by L. Nielson. Forty-six cases are on record in which active lupus was transformed into carcinoma, and twelve cases in which the latter disease developed in the scars of a former lupus.

A form of the affection occasionally met with has been termed *acne-lupus* or *lupus miliaris*. Discrete, slightly elevated tubercles, of a deep-red color and pin-head size, resembling the lesions of acne in an early stage, may make their appearance upon the face. They show, however, no tendency to suppuration, but gradually enlarge, become purplish in color, and exhibit a characteristic, honey-like transparency. It is probable that lupus may begin in this manner more often than is generally supposed.[1]

Lupus of the extremities was observed in 24.5 per cent. of all the cases of lupus treated in Doutrelepont's clinic during a period of seven and a half years. In nearly half of the number, the first manifestation of the disease was upon the extremities; but in only eight cases was this the sole localization of tuberculosis, glandular or pulmonary lesions being coexistent. The extensor were affected more frequently than flexor surfaces. Usually the disease upon the limb did not interfere with its functions; but occasionally the pressure of cicatrices obstructed the circulation.

The vulvo-anal region is occasionally involved. Macdonald[2] and Isaac E. Taylor[3] recited some interesting cases, and the latter has shown that the deformity and disfigurement from the ulceration and cicatricial contortions are greater and more disgusting than the corresponding changes in the face, resulting from this disease. It should be stated, however, that Dr. R. W. Taylor, after a prolonged and exhaustive study of disease of the vulva, is convinced that most of these cases have been erroneously diagnosticated. Various causes, common or specific, may lead to chronic ulceration and extreme deformity of the female genitalia, some of which lesions may be mistaken for lupus vulgaris.[4] Huguier, in 1849, described certain cases, under the title of esthiomène, which he thought favored the view that lupus of the vulva presents special characters distinguishing it from lupus occurring elsewhere. It is now believed, however, that the conditions formerly included under this name, constitute a clinical group, having different etiology, some being syphilitic, others atrophic, or hypertrophic, associated with chancroidal and other inflammations, or tuberculosis and aggravated by local want of cleanliness. Lupus does occur, however, in this region, although rarely, and does not differ essentially from the same disease occurring elsewhere in the body.

Professor Zweifel has related the history of a case in which the vagina and uterus were attacked by lupus. The father of the patient, a woman aged twenty-eight years, had died of phthisis, and her child was lame from hip-joint disease. The uterus was removed at the autopsy and a lupous ulcer was found upon its mucous membrane. Dr. Kocks, of Bonn, had met with a case in which labor was impeded by the existence of lupus of the cervix uteri. The patient had also lupus of the face. According to Dr. Max Bender, who analyzed a series of three hundred and eighty cases treated in the clinic of Prof. Doutrelepont, of Bonn, the mucous membrane is primarily attacked by lupus more frequently than was formerly supposed. He found that in 31.2 per cent. of the cases the mucous membrane was invaded before the disease appeared upon the skin. The mucous membrane and cartilage may be invaded either primarily or by extension from the skin. The parts most frequently affected are the mucous membrane of the eye, mouth, and throat, and the cartilage of the ear, eye, alæ, and septum nasi. When the nostrils are attacked, atresia or even complete obliteration of those orifices may be the result. From the auditory meatus, the disease may extend to the membrana tympani and middle ear and occasion grave otitis. Dr. Brieger, of Breslau, observes that the middle ear becomes involved in most cases of lupus of the nose. The alterations are sometimes trivial, at others of a serious character. In a series of two hundred cases of cutaneous lupus, Dr. Holger Mygind found laryngeal involvement in 20 per cent.; in most of these cases the same disease coexisted in the nose or mouth. Lupus of the mucous membrane is not very apparent in the early stage, as there is no evidence of its presence in the peculiar eruptive spots, as in the case of the skin. The mucous membrane first attracts attention through the fact of its being reddened with spots about the size of a pin's-head, somewhat prominent, and closely packed together. The spot may be firm to the touch, excoriated, easily bleeding, and appear at different points, of a silvery-gray color. Later, the patch may become more irregular, the color more gray, or opaque. The thickened epithelium desquamating, there is left an inflamed superficial or a deep-fissured or an ulcerated surface. Gradually these conditions disappear, and there remain simply scars that may have a shining and silvery-gray appearance. On the other hand, the patch may be depressed, from being bound down to the underlying tissue, or secondary inflammatory infiltration may develop, leading to suppuration, abscesses, and ulceration of the part, attended with cicatrization. The destructive action of this disease, therefore, occasions unsightly scars and considerable deformity upon whatever part of the body it may occur. Lupus vulgaris is not usually attended with subjective symptoms in its earlier stages, but in the course of time pain may be present, especially if ulceration has set in, and the surface be exposed to atmospheric changes, to movement of the part, or to friction of the clothing.

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[1] Medical Bulletin, February, 1890, p. 58.

[2] Edinburgh Medical Journal, April, 1884.

[3] American Gynecological Transactions, vol. vi, p. 199.

[4] "Chronic Inflammation, Infiltration, and Ulceration of the External Genitals of Women, etc.," by Dr. R. W. Taylor. The New York Medical Journal, January 4, 1890.

Lupus vulgaris may give rise to inflammatory enlargement or to caseous degeneration of lymphatic glands anatomically connected with the diseased area, infective material being conveyed by the communicating lymphatic vessels. Leloir states that tubercular adenopathies are rare and are quite late in making their appearance. On the other hand, lupus of the skin, as pointed out by Radcliffe Crocker and J. F. Payne, may be secondary to tuberculosis of neighboring glands. Dr. V. Lespinne has described certain severe infectious phenomena which he has occasionally observed to complicate the course of lupus. The temperature rises abruptly, the patient is profoundly prostrated, the stomach and bowels are disordered, bronchitis occurs, and perhaps endocarditis. These manifestations develop very rapidly and almost simultaneously; the condition of the patient resembles that of typhoid fever or acute miliary tuberculosis. This constitutional disturbance suggests what is seen after the injection of tuberculin. In some cases the disturbance subsides and entirely disappears, while in others, general tuberculosis supervenes. Organic disease of the heart may be left as a result of the endocarditis. Lupus is apt to become complicated with local attacks of congestion, inflammation, edema, or erysipelas. Lupus, as pointed out by Virchow, may accompany tuberculosis of the joints, and may be the explanation of a fungous inflammation of a dry character—so-called *caries sicca*—which may occur in otherwise healthy, well-nourished persons. In fact, a large proportion of lupus patients are, and continue to be, rather well nourished, thick-set individuals, enjoying excellent health, in whom nothing like dyscrasia or any special diathesis is recognizable. (Volkmann.)

Bar and Thibierge have studied the effect of pregnancy upon lupus. The influence is variable, the lesions being sometimes improved, in certain cases aggravated, and in others unaffected.

**Diagnosis.**—Lupus vulgaris, according to Richard Volkman, occurs in a majority of the cases between the ages of 9 and 15 years. It may commence in childhood, and be found still present, fifty years or more subsequently. The principal points, sufficing in most cases to establish the diagnosis of the disease, are its occurrence early in life, the existence of primary eruptive spots, their development into papules, tubercles, and ulcers, the very chronic course of the malady, and at the attempt at repair in the shape of unsightly cicatrices. The affections liable to be mistaken for it are syphilis, epithelioma, and lupus erythematosus. From *syphilis* it can be distinguished by the history of infection in the venereal disease, and by the rapid development and characteristic grouping of the lesions in this affection. The tubercles, however, in both diseases resemble each other, and it is often most difficult to distinguish between them. The tubercles of lupus develop slowly, being generally confined to one region, as the face, and are flatter and softer than in syphilis, and of a brownish or yellowish-red color, covered with thin scales; whereas, in syphilis the tubercles develop rapidly, appearing upon several portions of the body at the same time, and they are round, har[illegible]ger than in lupus, and of a coppery hue. The ulcerations in lup[illegible]e contrary, v[illegible]rent from those that are met with in syph[illegible] generall[illegible]-

times irregular in shape, and are not so excavated, and the margins not so infiltrated and painful as those of syphilis. Lupous ulcers usually occur at several points, and tend to coalesce, while in syphilis, if more than one ulcer be present, they generally remain apart. The edge of the lupous ulcer is dull-red, non-everted, and the secretion is slight, but not foul, and if there are crusts, they are reddish, brown, and scanty. On the contrary, the edge of the syphilitic ulcer is sharply cut and everted, the secretion copious, foul, and the crusts which are usually present are greenish and abundant. Lupous ulcers, as indicated, develop with relative slowness, and are attended with ugly scars and deformities; whereas, syphilitic ulcers appear and run a rapid course, the resulting cicatrices being smooth, white, superficial, and not unsightly. The constitutional symptoms of syphilis (alopecia, sore throat, bone nodes, etc.) will aid in the differential diagnosis.

Lupus may also be mistaken for *epithelioma*, but the history, appearance of the lesions, and the course of the diseases, are altogether different. Lupus generally begins in childhood, and is seldom attended with subjective symptoms. Epithelioma usually occurs late in life, and is frequently painful. In lupus, moreover, there are several or many nodules, which are soft, whereas in epithelioma the nodule is single, and is particularly hard. Furthermore, it must be remembered, lupoid ulceration is superficial, the margin non-everted, not hardened, the surface covered with a bright-red granular tissue, and there is a tendency to repair, ending with cicatrices. Ulcerated epithelioma, on the contrary, is usually deep, the margin everted, hardened, undermined, the surface fungoid; there is no attempt at the formation of cicatrices; the adjacent glands are usually involved. Lupus, likewise, is more slow in its development than epithelioma, and rarely affects the general health, whereas epithelioma is relatively more rapid, and generally attended, sooner or later, with constitutional impairment. It should, however, be born in mind that the two diseases occasionally appear upon the same surface. Lupus may, moreover, in rare cases, at certain points degenerate, or develop, into epithelioma.

*Lupus erythematosus* can scarcely be confounded with the disease under consideration. The development of the former only after puberty, the appearance of reddish, circumscribed, slightly elevated patches, covered with thin, grayish, or yellowish, adherent scales, the involvement of the sebaceous glands, and the absence of papules, tubercles, and ulcers, should suffice to differentiate it from lupus vulgaris. *Rosacea* may in some cases resemble lupus in certain respects, but its history, course, color, and the presence of dilated vessels, acne papules, and pustules, readily serve to distinguish it from the latter disease.

The late Professor Oscar Liebreich, of Berlin, devised two new instruments which serve the double purpose of assisting the diagnosis of lupus and determining whether improvement is apparent or real. The first of these instruments is called the phaneroscope, and is thus described:[1] "It consists of a lens placed at one end of a cylindrical tube, the other of which is funnel-shaped, and terminates in a small aperture. If a light be properly placed behind the lens, and the phaneroscope be applied to the skin so that the small aperture almost touches it, the skin is rendered luminous and translucent. Where healthy skin is present, an inner, yellowish circle of light is seen surrounded by an outer circle of a bright-red color. By means of the phaneroscope any portion of skin can be rendered luminous. The greater the number of capillaries the brighter is the red of the illuminated spot. Where anemic skin is present the illuminated circle is pale. The second instrument is a small round plate of glass set in a metal frame, which Liebreich uses instead of digital pressure in lupus examinations. The advantages of this simple arrangement (which may be called a 'transparent finger') are obvious. The skin can be observed not only after but during pressure. By its help portions of lupus which might otherwise escape detection can be seen, the redness not disappearing under the pressure. If instead of the plain glass, a lens is used, the skin is illuminated during pressure and the examination is thus much assisted. The lens can be pushed from place to place, and will show lupus below the surface when it is not visible to the unassisted eye."

Lupus vulgaris, by its clinical features, is differentiated from other forms of tuberculosis of the skin. These are usually caused by local infection by inoculation. The tuberculosis cutis orificiale, the verruca necrogenica, and scrofulosis cutis are of this character. The exanthematic miliary tuberculosis sometimes met with after acute diseases in children, is usually attended by other evidences of tuberculosis. These all pursue a different clinical course from lupus vulgaris.

**Pathology.**—The pathology of lupus vulgaris has been investigated by very many physicians, and its relations to tuberculosis have finally been definitely established. All modern investigators agree that the morbid process is a chronic tuberculous inflammation, and consists of a small-celled infiltration, having its primary seat in the corium, and spreading secondarily to all the layers of the integument.

According to the researches of Kaposi, Lang, Stilling, Thin, Jarisch, and others, the blood-vessels act the chief part in the genesis of the lupous infiltration. A microscopic examination of one of the more deeply seated nodules of recent origin, will show that the delicate network of connective tissue proper to the skin contains a small-celled infiltration, the cells being gathered together into a nest-like formation in the lower portion of the corium, the upper or papillary layer above them, and the rete appearing normal. The nest will also be found surrounded with a dense layer of

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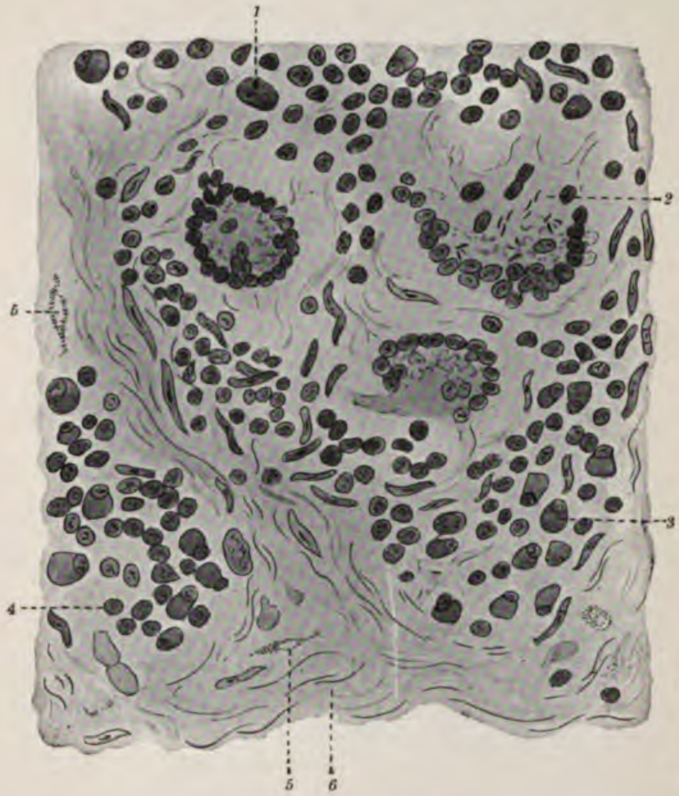
[1] Berlin Correspondence of British Medical Journal, May 9, 1891.

PLATE XXII

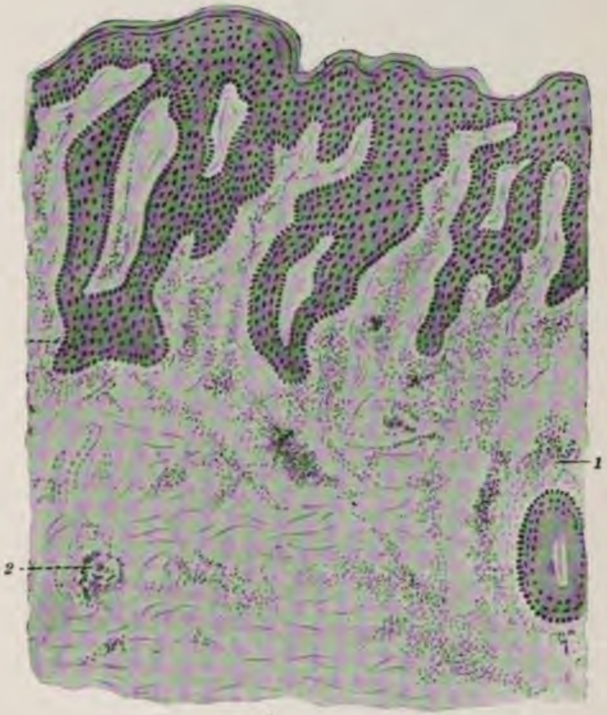


Nodule of Lupus Vulgaris.

1, Connective tissue nucleus.
2, Giant-cell, showing bacilli.
3, Plasma-cell.
4, Small plasma-cell (daughter plasma-cell).
5, Mast-cells.
6, Distribution of collagen.

(See page 688)

# PLATE XXIII



Lupus Vulgaris.

1. Plasma-cell infiltration around the blood-vessels, hair-follicles, and some of the sweat-glands.
2. Tubercular focus, giant-cells in centre.

(See page 688)

connective tissue, and to be sharply defined from the normal corium in which it is embedded. The cells, which are very small, contain numerous highly refractive nuclei, which can be stained by carmine. These nest-like accumulations of cells have no firm connection with the network in which they lie, and part or all of them may lose form, even during the short time of preparation for microscopic examination, leaving in the connective tissue empty spaces and many blood-vessels. In the further development and retrogressive metamorphosis of lupus vulgaris is produced a most complicated change, both in the lupous tissue and in all the elements of the skin. In respect to the nodule itself, after it has existed for a greater or less length of time, retrogressive changes begin in its centre. The vascular supply being interfered with by the cell-growth, fatty degeneration ensues, and the larger part of the nodule is absorbed or thrown off. A part, however, organizes into connective tissue and undergoes contraction. While the solitary lupous nodule undergoes the changes just described, the morbid process usually becomes more extensive in its ravages. The infiltration extends along the vessels beneath the papillæ, as well as those ascending into it, until, meeting with like spreading growth, the whole of the affected part is crowded with the small cells above mentioned, and the areas involved undergo, in the same way as with the single nodule, fatty degeneration and absorption, with cicatricial contraction of the skin. In some persons chronic inflammatory changes occur in the affected connective tissue, and the papillæ, becoming hypertrophied, produce lupus verrucosus. According to Kaposi, the epithelial structures are in this disease early affected. As the infiltration passes down and involves the papillary layer, proliferation and degeneration of the rete cells occur, and, when the latter are destroyed by suppuration, the lupous lesions are exposed and ulceration follows. At an early stage, as the disease spreads, it affects the hair-follicles and the glands of the skin, causing hypertrophy and degeneration of the epithelial lining. The hairs, therefore, fall out in consequence of the atrophy of their papillæ, and many of the sebaceous glands are cut off from communication with the surface, the dilated glands appearing as milium corpuscles. At times there are outgrowths of the epithelium which pass down into the corium, and which, uniting with similar growths in the root-sheaths and sweat-glands, develop an epithelial network, described by Kaposi, which may form the histological basis for the production of epithelioma.

**Etiology.**—The predisposing and indirect causes of lupus vulgaris are in doubt. The exciting cause is the tubercle bacillus which may be found in the lupous nodules. It is known that it develops during childhood, and rarely after puberty, unless some sign of the disease, evident in the form of scars, had previously appeared. Lupus vulgaris is neither congenital nor hereditary, and occurs in about equal proportions in both sexes. It is a rare affection in the United States, but is much more common in certain

European countries, as in Germany, Austria, and France. It is asserted by some observers to be owing to syphilitic taint; while many hold that lupus vulgaris is a disease of its own kind, with an unknown cause. Abundant clinical experience has shown the error of associating it with syphilis, for the reason that the history and course of the two diseases have nothing in common, and that syphilitic treatment has usually no influence on lupus. As to its relation to scrofula and consumption, no one can deny that many cases of lupus have either the one or the other of these affections associated with them.

That lupus is an expression of scrofulous diathesis, is held by Piffard and others in the United States, and by many observers in France, England, and Italy. Friedländer and many others consider the disease a local manifestation of tuberculosis. Doutrelepont, of Bonn, who believes that lupus vulgaris is a form of tuberculosis of the skin, has given the result of his researches in several able articles. The presence of the tubercle bacilli in lupus tissue has been reported by Koch, from cases examined by him. Benson, of Dublin, also has observed[1] some interesting experiments, showing that granulations taken from the conjunctiva of a child and inoculated into the eye of a rabbit developed tuberculosis of the cornea and iris of the animal. At the Dermatological Session of the International Medical Congress at Copenhagen, Doutrelepont read an interesting paper[2] on the subject, citing in support of his opinion the histological structure of the lupous tubercles, and mentioning the presence of the bacillus, which he had found in many cases, culture and inoculation experiments having yielded good results, and stating that the clinical course of the disease was in favor of the view of the intimate relation between lupus vulgaris and tuberculosis. Kaposi, who believes with Hebra and others that the disease is *sui generis*, in replying, rejected unqualifiedly the opinion that lupus is simply tuberculosis of the skin. He did not deny the presence in lupus, of the tubercle bacillus which he had seen, and to which he attached no importance. He made a distinction between lupus vulgaris and other forms of tuberculosis of the skin. Leloir also opposed Doutrelepont's view, and reported that Cornil and himself had, after extensive investigation, succeeded in finding only one single bacillus, and that was in an individual decidedly phthisical. It is admitted by all that the number of tubercle bacilli present in lupous lesions is small. It has been suggested that the comparatively low temperature of the skin, and possibly its continual movements, render it a poor culture ground for the bacilli.

In a more recent paper Leloir suggests that the course of lupus may be determined by the combined influence of the tubercle bacillus of Koch and the microbes of suppuration (mixed infection). Dry lupus contains no microbes of suppuration. Leloir believes that the ulceration depends not upon the pathogenetic germ of lupus, but upon independent pathogenetic organisms, in all probability those of suppuration. The bacillus tuberculosis and the treatment adopted in consequence of its presence open a gate of entrance to the pathogenetic agents of suppuration. "Lupus, properly so called, gives rise to a tubercle which ulcerates, perhaps only under the influence of the agents of suppuration."

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[1] British Medical Journal, January 17, 1885.

[2] Transactions of the International Medical Congress, Copenhagen, Denmark, 1884.

Pick, of Prague, has also thought that lupus was a form of tuberculosis of the skin. Haslund has pointed out that, while many lupous patients die from tuberculosis, yet, if lupus is tuberculosis of the skin, it is a form of the latter disease which has not hitherto been known as such in a clinical sense. The experience of a large number of observers no doubt goes to show some relation between lupus and tuberculosis, although the former disease appears in many who are in apparently good and often vigorous health. In 1883, of thirty-eight cases of lupus at the Hospital St. Louis, eight had well-marked signs of phthisis. I have also seen two women, to all appearance healthy and well developed, have lupus vulgaris, and both die of tuberculosis, one in six months, the other in about fifteen months, after lupus on the face had been cured.

A family history of tuberculosis may be obtained in certain cases of lupus. From the statistics of eighty hospital cases, Fox has shown that scrofulous or tuberculous lesions of the skin, bones, glands, or joints were frequent complications. Emlyn Jones studied and classified 923 cases of lupus vulgaris and found that in 11.4 per cent. the disease was secondary to tuberculous disease of the lymphatic glands, arising either in scar-tissue, or in abscesses of the glands. 1.8 per cent. of the cases were secondary to tuberculous bone-disease. In 39 cases there was a pronounced history of tuberculosis and in many others the history was suspicious of this disease.

Koch, Leloir, Benson, Trousseau, and others, have succeeded many times in producing tuberculosis of the iris or general tuberculosis, by introducing lupous material into the anterior chamber of the eye or the peritoneum. Mr. Eve inoculated the ear of a rabbit with lupus. Two cases having a direct and important bearing upon the subject have been reported by Dr. Jadassohn from the clinic of Professor Neisser, of Breslau. In one instance accidental inoculation followed a wound of the finger received by a butcher in cutting up the tuberculous carcass of an ox. In the other, a woman was tattooed upon the forearm by a consumptive man who moistened the Indian ink with his saliva. In each case nodules having the microscopic appearance of lupus developed at or some distance from the site of inoculation, upon the same limb. The nodules gradually broke down, forming ulcers which, when excised and examined microscopically, showed typical lupus tissue. A few tubercle bacilli were likewise detected. Robert Koch reported that, in seven cases, he had found tubercle bacilli in the nodules, and that he had succeeded in producing indubitable tuberculosis by inoculation of cultures from these lesions. Mr. Clement Lucas has seen lupus upon the glans penis probably as a result of inoculation from the operation of circumcision. The same observer describes a case which occurred in the attendant of a woman who had long suffered from lupus. The nurse was in the habit of dressing her mistress's sores. He likewise knew of a case in which a policeman's knuckle was affected with lupus in consequence of a tooth-wound. Besnier has seen lupus arise from inoculation with vaccine lymph infected with the element of tuberculosis.

**Treatment.**—Lupus vulgaris is a stubborn and troublesome affection, sometimes resisting the very best treatment in the most skillful hands. It requires both well-directed and persistent measures for its successful treatment. In the first place, it is important that the hygienic surroundings should be suitable and in the best possible condition. The patient should be properly clothed and the sleeping apartment well ventilated. Bathing, active or passive exercise, plenty of fresh air and sunshine, and all other hygienic measures that add to general health and vigor, are of great value. A change of climate also, if practicable, will often assist in causing some of the most obstinate cases to yield eventually in a satisfactory manner. It is essential to employ both constitutional and local treatment at the same time, the former to act against and remove the source of the disease, and the latter to destroy, or at least to cause to disappear, the existing lupoid tissue.

In the vast majority of cases of lupus vulgaris of the face, Henri Caroche maintains that the disease comes through propagation through the lymphatics from a lupous lesion situated on the mucous membrane in the nose. Simple treatment of the nasal mucus membrane, he declares, is able, in certain cases, to induce a retrogression of the lupus of the face, and, inversely, the nasal lesion is a constant cause of reinoculation of the skin. The examination and treatment of the nasal mucosa is of prime importance.[1]

**Constitutional Treatment.**—Lupus patients who are pale, anemic, cachectic, and scrofulously or tuberculously inclined, and perhaps have not been receiving the proper kind of food, require a good, nutritious diet. Animal food, with a large amount of milk, and in the case of adults a moderate amount of stimulants, are often most suitable. Codliver oil, in full doses and long continued, either alone or in combination with malt or other preparations, is perhaps the most efficacious remedy, especially for the class of patients mentioned, that can be employed. In children, the oil may be administered by inunction. For this purpose, Granville MacGowan, of Los Angeles, Cal., uses the following combination:

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[1] La Presse Medicale, Sept. 25, 1907.

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|---|---|---|---|
| ℞ Heliotropin .................... | gr. iij. | .18 | |
| Adipis lanæ .................... | ℥vi. | 180. | |
| Olei morrhuæ .................... | ℥ix. | 270. | M. |

In this formula, the objectionable fishy odor is almost entirely overcome. Besnier and Neisser both report good results from iodoform, which can be given in from one-half to one grain (0.03 to 0.06 gm.), in pill-form, three times a day. Morel-Lavallée has derived advantage from the hypodermic injection of iodoform. He believes that this treatment is an advantageous preliminary to mechanical methods. The injections need not be made at the site of the disease. The dose is about one-third grain (0.02 gm.) daily for an adult or one-sixth grain (0.01 gm.) every two days for a child, and the iodoform is suspended in liquid vaseline with the addition of eucalyptol. Rüsin reports a case of very extensive lupus in which benefit followed the subcutaneous injection of a one-per-cent. solution of chloride of gold, in combination with a one-per-cent. solution of cyanide of potassium. Six injections were made in eleven days, the total quantity of each of the salts amounting to $^{33}/_{1000}$ grain (0.00198 gm.), single doses of the chloride ranging from $^{1}/_{1000}$ to $^{1}/_{100}$ grain (0.00006 to 0.0006 gm.), and of the cyanide from $^{1}/_{1000}$ (0.00006 gm.) to $^{1}/_{125}$ grain (0.00048 gm.). Dr. William Robertson reports good results in the first stage from the subcutaneous injection of corrosive sublimate in one-per-cent. aqueous solution, five or six minims of this being injected into the affected part. Professor Landerer claims good results from injection into the nodules, once a week, of an alcoholic solution of one part of cinnamic acid, one part of cocaine hydrochloride, and twenty parts of alcohol, one or two drops being injected till ten drops have been used at one *séance*. Creosote has been used in lupus, as in other manifestations of tuberculosis. Potassium chlorate, the chalybeates, and phosphorus, alone or in various combinations, are most valuable. The alimentary canal should always receive attention, and weak digestion be regulated. In the latter contingency, an occasional aperient or purge, followed by mineral acids and bitters, is often most beneficial. Robust and well-nourished individuals often do well under potassium iodide or iodine. Sometimes small doses of one of the mercurials act in the most happy manner by hastening absorption of the lupous tissue. Arsenic is sometimes of service. It may be prescribed alone in the form of arsenic trioxide, Fowler's (or Pearson's) solution, or in combination with iron. Professor Hardy, of Paris, esteems chloride of sodium a valuable remedy. He administers it in daily doses of fifteen to forty-five grains (1 to 3 gm.). The chloride of calcium is also a very good constitutional remedy. I have seen decided benefit from the iodosulphate of cinchonine in the dose of one to five grains (0.06 to 0.30 gm.) three times a day. This is a valuable antiseptic combination, especially useful when the patient is of a scrofulous or tuberculous type.

TUBERCULINUM—TUBERCULIN (*Koch's Lymph*).—Koch's lymph has been used as a means of diagnosis and treatment. Under the influence of this fluid, local and constitutional reaction takes place in the subjects of tuberculosis. In lupus, from three to eight hours after an injection, the ulcer reddens, swells, and begins to secrete a thick serum. The temperature rises to 102°, 103°, or 105° F. This elevation continues for eight to twelve hours. During the course of the treatment the oozing gradually subsides, and the ulcer begins to cicatrize. The experience of the author has shown that this mode of treatment has neither been superior nor equal to the older methods which have been described. Neither are these injections without danger to life, nor free from objection on the ground of communicating or generalizing the infection.

F. Nagleschmidt states[1] that when a tubercular lesion of the skin is inoculated with tuberculin the skin ulcerates; whereas, if the healthy skin be inoculated, a papule will form, but there will be no ulceration. He has taken advantage of this fact to determine if a lupus patch is cured, especially after the action of the Finsen light. In addition to its diagnostic value, this procedure is curative, for if the nodule ulcerates it usually is followed by a definite cure.

He recommends the local injections of Koch's tuberculin in minute doses, directly into the lupus or other nodule, where Finsen treatment is not available, or if the foci of disease are isolated. He says the only objections to its use, are the loss of substance from the ulceration and the general systemic reaction, if too much tuberculin is absorbed or too great a quantity used.

As an aid to diagnosis, the procedure is certainly not infallible, for in some cases general reaction has occurred in the absence of pulmonary disease, but without benefit to the local lesions. According to observations in Vienna, Koch's fluid caused reaction in other neoplastic processes, as lupus erythematosus, syphilis, epithelioma, leprosy, carcinoma, and sarcoma.[2] H. Levy, of Berlin, in April, 1891, exhibited the young woman who was the first lupous patient treated by tuberculin, and in whom the insignificant effect of a nearly six months' course of treatment could be observed. Although in some regions cicatrization had been produced, yet in others the diseased tissue had been entirely unaffected or only partially destroyed. The improved form of tuberculin (TR) has proved no more successful than the original.

The thyroid therapy also has been applied to lupus, and in a number of reported cases with encouraging results. Dr. Byron Bramwell in some cases observed decided improvement from this method. Zum Busch witnessed several cases of improvement from thyroid or thyroidin. Malcolm Morris also has had the same experience in an old and severe case of lupus.

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[1] Deutsche medizinische Wochenschrift, Berlin, Oct. 3, xxiii, No. 40.

[2] Koch has recently devised a modified tuberculin by mechanically reducing the bacilli to a detritus and removing the fatty acids by which they are enveloped. The new fluid is to be used hypodermically, and the initial dose is $\frac{1}{500}$ milligramme. Injections are repeated every second day and the dose gradually increased.

A compound termed "thiosinamin" has been introduced by Dr. Hans Hebra, of Vienna, as useful in this disease. Thiosinamin is a white crystalline substance, of a slight aromatic odor, which is obtained by the action of ammonia upon the volatile oil of mustard, and chemically is allyl-sulpho-carbamide. It is not official. It is soluble in alcohol and ether, but decomposed by solution in water. When hypodermically injected, thiosinamin causes a local reaction in lupus. The diseased surface is swollen for several hours, but it is said that no evident constitutional symptoms occur. In consequence of the injection, it is reported that the nodules undergo involution, ulcers become clean, and cicatrization takes place within a few weeks. The potassium cantharidate treatment for tuberculosis, introduced by the late Professor Liebreich, has also been applied to lupus. This substance is hypodermically injected in doses of one to two decimilligrammes ($\frac{1}{640}$ to $\frac{1}{320}$ grain). It does not usually occasion a decided febrile reaction. It has of late been proposed to treat lupus by the inoculation of erysipelas streptococcus, in pure culture. In some cases a good result has been reported; in others the improvement was but temporary. Furthermore, the severity of the resulting erysipelas can neither be foreseen nor controlled, and the treatment may expose the patient's life to danger.

**Local Treatment.**—The employment of local measures is important in effecting the absorption or the destruction of the existing lupous tissue, and in averting any complication or secondary change. In selecting the most suitable applications, it is important to take into consideration the stage and variety of the disease, for the employment of too active measures often tends to stimulate the morbid process and enlarge the patch. In the earlier stages, local depletion with the small needle-knife may be employed for the purpose of bringing about absorption—a method which I much prefer to that of multiple scarification, as proposed by Volkmann, and modified by Dubini, Squire, and others. The sharp point of the knife in the hands of a skillful operator can be rapidly passed to the required depth into the diseased tissue with a more satisfactory result than that secured by the use of any edged blade, which necessarily goes through normal as well as abnormal skin at the same time. The operation may be repeated every three or four days, the parts being allowed to bleed freely from the application of warm water, thus lessening very much the congestion of the patch. A mild mercurial ointment (the white precipitate, calomel, or the oleate) can be used, as an after-dressing. Auspitz recommended puncture combined with the introduction into the lupous nodule of iodized glycerin; to be followed by the introduction of a caustic conveyed by means of a rubber pipette attached to a hypodermic syringe needle. Encouraged by the efficacy of balsam of Peru in local tuberculosis, Saalfeld, of Berlin, has made use of this agent in the treatment of ulcerated lupus. The remedy was applied twice daily with a brush. The results were rather inconclusive, though it was thought that a certain ameliorative influence was exerted. Vidal speaks well of the value, in the earlier stages, before ulceration appears, of frictions over the part, every three or four days, of oil of cashew-nut. Iodine and glycerin, or phenol (the latter in moderate strength) are often useful, painted over the part. In order to destroy the nodules, they have been punctured by nitrate of silver cones, or by pointed sticks dipped in phenol or chloroacetic acid. Dr. Cordero has in some cases been successful in securing cicatrization by means of atomization of a ten-per-cent. phenol solution for fifteen or twenty minutes daily. The same solution is used meanwhile as a dressing to the ulcer. Jequirity, as I have pointed out, is especially efficacious, though considerable inflammation and destruction of the lupous tissue follows. Drs. Smith Townsend and Hamilton report a good result, in an old case of lupus of forty years' standing, from the application of the alveloz, a newly discovered South American plant, which acts in a similar manner to jequirity. The mercurial, as well as subiodide-of-bismuth, plaster, will also now and then exercise a beneficial influence. The ointments of tar, naphthol, salicylic acid, chrysarobin, and iodoform have been advantageously employed in some cases. Dr. Filgien has witnessed improvement from the use of iodoform gauze saturated with codliver oil. Unna recommends that lupous nodules be operated upon, in series of tens, according to the following method: A small incision is made into the nodule by means of an acne lance. A shred of absorbent cotton is wrapped around the end of a pointed piece of stick dipped in a solution of corrosive sublimate one part (1-1,000), phenol, or creosote, four parts, alcohol twenty parts. The moistened cotton is carried into a nodule by a spiral motion and allowed to remain ten or fifteen minutes. The deposits so treated are absorbed within a few days. The same observer also reports favorably of the effect of massage of the nodules. He has satisfied himself, moreover, that repeated application of the oil of cloves will cause retrogression of the nodules. Resorcin is an efficient local remedy. It may be used as an ointment in the proportion of one part to two of excipient. From its peculiar action in causing necrosis without suppuration, formalin will probably be found a useful application to lupous nodules. Dr. M. F. Coombes, of Louisville, claims a good result from the application of three parts of methyl violet to one thousand parts of water. Among other useful ointments are those of red iodide of mercury, iodide of sulphur, salol, creolin, betanaphthol, and salicylated camphor. The latter preparation is made by heating together eleven parts of salicylic acid with fourteen of camphor. The use of an unguent containing from twenty to thirty grains (1.30 to 2 gm.) of chaulmoogra oil to the ounce (32 gm.) has, in some instances, been attended with success. The iodosulphate of cinchonine is an excellent topical remedy, preferably in the form of an ointment in the strength of a drachm (4 gm.) to the ounce (32 gm.). Good results can often be obtained in lupous ulcers by covering them with powdered red cinchona bark, or iodoform. Moorhof and others have derived good effects from the application of lactic acid to the surface of lupous ulcers. Ointments containing ten per cent. or more of thymol iodide or of europhen are of value in ulcerated lupus. Hydroxylamine promotes cicatrization. Eade highly esteems yeast as an application to lupous ulcer, in its pure state or made into a poultice with flax-seed. Lysol has been employed with advantage. This is a new tar combination, made by boiling tar oils with alkalies and fats. It has the consistence of soft soap, is soluble in water, and is a good antiseptic, more powerful than phenol, less variable in composition than creolin, and not as poisonous as either of these substances. Lysol may be applied either to ulcerated or non-ulcerated surfaces by means of cotton. It is allowed to dry on the surface, and should not be applied too often, as it will cause pain and cracking of the skin. If used in this manner the pain which lysol produces is not of long duration. In lupus of the nasal mucous membrane, it is well to cocainize the surface thoroughly before making the application.

D. A. Ravogli[1] in a contribution upon lupus vulgaris recommends lysol. He says: "The best results so far have been obtained from the applications of pure lysol. The new ulcers are touched up with a piece of cotton dipped in lysol; the pain is not excessive. It produces a coagulation of the serum of the tissues, so as to form a hard, whitish eschar, which falling out leaves a healthy tissue which soon cicatrizes. In the case of diffused lupus of the foot, I have obtained the best results from lysol. When the nodules appear, I open them and remove their contents, and insert a piece of cotton saturated in lysol. In a short time the nodules are brought to recovery."

If the patch shows no sign of yielding, if fresh tubercles continue to appear, and there is every evidence that the disease is spreading, then there is no alternative but to cauterize, with certain chemical substances, actual or galvano-cautery, or to treat the part by erasion, alone, or in conjunction with the measures just enumerated.

Dr. A. Minto Macdonald and Mr. J. Rutherford Hill report[2] good results from the application of either the solid chloride of antimony by means of a glass rod, or of a 30-per-cent. solution. The latter exercises a selective action upon the tuberculous nodules, causing them to disappear, as had been previously pointed out by Unna. In two cases of lupus of the face, treated by these observers, the normal skin was not attacked by the solution, while the diseased parts were beneficially affected.

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[1] The Journal of the American Medical Association, January 5, 1907.

[2] The Lancet, February 29, 1908.

Cauterization, when used, should be made once or twice a week, or repeated at such intervals as necessary, until all evidence of the disease has disappeared. Sodium ethylate solution is one of the most powerful and active remedies. Pencilled lightly over the surface, it penetrates deeply, destroying the morbid tissue, and leaving a black and burned surface more or less covered with serum, which it rapidly abstracts from the parts. Pyrogallic acid likewise possesses the power of deep penetration, analogous in this respect to sodium ethylate. It has the additional advantage of acting only upon the diseased tissue, the normal skin around it being in nowise affected by its application. Pyrogallic acid may be used in the form of an ointment, one or two drachms (4 or 8 gm.) to the ounce (32 gm.), and the application renewed every twenty-four hours. In the course of three days or more the surface becomes black and covered with inflammatory products, which can be removed by a poultice, or oil, and the part dressed with a soothing ointment. There may be pain from this remedy, particularly about the third day, but it is not severe. The application may have to be repeated three or four times, and the resulting scars are smoother and better than from the use of many other remedies. Schwimmer has employed pyrogallic acid as an ointment, or by painting the lesion with an ethereal solution, and covering it with a layer of traumaticine. Considerable irritation at first results, accompanied sometimes by swelling, but this soon subsides, and the method is said to produce a smooth cicatrix. Caustic potassa is also a powerful cautery, that may be applied to the lupoid tissue either in the solid form, with a pair of forceps or with a piece of wood, or as a lotion. The solution may be made of equal parts of caustic potash and water, or of one to three drachms (4 to 12 gm.) of caustic potash to the ounce (32 gm.) of water, applied over the surface with a camel's-hair brush or with cotton. Vienna paste, which consists of equal parts of caustic potassa and lime, with a sufficient quantity of alcohol to blend them into a proper mass, can be applied, instead of the caustic potassa alone. The pain from the application of caustic potash, either solid or in solution, is often very severe, and to lessen it, acetic acid, a neutral ointment, or a poultice, should be employed immediately after cauterization. A dressing of iodoform then applied over the surface and allowed to remain for several days, or a week, often assists in completing the destruction of the diseased tissue. Arsenic trioxide is a valuable caustic that has been sometimes favorably used in lupus. It is an exceedingly painful application, but has the property of acting only upon the lupoid tissue, leaving the healthy skin unaffected. Arsenic oleate, one-half to one drachm (2 to 4 gm.) to the ounce (32 gm.) of any fatty substance, is the best method of employing it. This compound should be thickly spread on muslin or linen, and used directly to the part for a period of two or three days, the dressing being renewed every twenty-four hours. The pain, which is very great after the first day's application, can sometimes be lessened by adding a few grains of the extracts of opium and belladonna to the ointment. There may also be a swollen and edematous condition of the parts, but arsenical poisoning has never been known to occur from the application either of this or other forms of arsenic to limited portions of the integument. After the removal of the dressing, the lupous nodules will be found to have been destroyed, the spots to have been cauterized a gray or brownish-black, and to be covered perhaps with pus, the adjacent portions of healthy skin being unaffected. F. Huber reports good results from the external application of Fowler's solution. The nitrate of silver, either as a concentrated solution or in the form of the solid stick, may be used as a mild and safe caustic. It is a most suitable application to the skin, and to the mucous membrane also, when involved. The pain from its employment is not great, and leaves moderate, smooth, white scars. A most convenient way of applying nitrate of silver is by means of the solid stick, which can be pushed over the surface and bored into all the papules, tubercles, and deep spots, coagulating the albumin of the parts. It easily penetrates into the lupoid tissue; but only to a limited depth, its action being superficial. Cauterization with this agent should be made once or twice a week, with a soothing dressing applied at once to the parts. Silver oleate, one or two drachms (4 to 8 gm.) to the ounce (32 gm.) of a fatty substance, is also a valuable caustic application. Zinc chloride is frequently employed, and is well adapted for its caustic effect, used either alone in the form of a stick, or with water, alcohol, or other caustics made into a paste. The objections to the use of chloride of zinc are that it is not deep in its penetration, will not coagulate the blood, which often flows, interfering with further cauterization, destroys healthy as well as morbid tissue, and occasions the most severe pain. Hebra employed this caustic made into a paste in the following manner: Two drachms (8 gm.) each of zinc and antimony chloride, are rubbed up in a mortar with sufficient strong hydrochloric acid until the former is completely dissolved; powdered licorice is then added in such quantity as to form a thick, tenacious paste. The prepared zinc paste is spread quickly on linen and applied in strips for twenty-four hours. On removal of the strips, the skin that has been covered has become changed into a yellowish or brownish eschar. In applying chloride of zinc alone or as a paste, or any preparation of similar action, the surrounding healthy skin should always be protected by strips of adhesive plaster, or some neutralizing agent, the latter, when necessary, being used on the part, if it be wished to arrest the action of the caustic, and a suitable after-dressing should promptly be employed. The acetate of zinc, acid nitrate of mercury, glacial acetic and chromic acids, and phenol are likewise all useful preparations that can be employed as caustics.

Iodine and its combinations have been used, as ointment or glycerole, or carried directly into the tubercle upon the point of a needle. Plasters of salicylic acid, creolin, salicylic acid combined with pyrogallic acid or creosote, or creosote and lead plaster, have occasionally been beneficial. Camphorated naphthol is of service in promoting cicatrization. Doutrelepont covers the infiltrations with compresses wet in a solution of corrosive sublimate (1 to 1,000). The dressing is covered with a strip of caoutchouc held in place by a bandage. The same salt has been used dissolved in glycerin or collodion.

Parachlorphenol has been employed with alleged good results. This is a solid substance, scarcely soluble in water, but soluble in alcohol. The parts, being previously cleansed, were repeatedly touched with a solution of parachlorphenol. An ointment containing equal parts of the same substance with purified dehydrated wool-fat, petrolatum, and starch was then applied for ten hours. After curettage, powdered picric acid has been dusted freely upon the surface. After the crusts fell, the parts were dressed with a five- or ten-per-cent. picric-acid ointment.

The actual cautery and the galvano-cautery have been employed with decided success. The patient is usually placed under an anesthetic, although the operation can be performed, with either cautery, with only a moderate amount of pain. All lupous tissue may be destroyed in one treatment, but sometimes the operation requires to be repeated.

Professor Finsen, of Copenhagen, has elaborated a method of concentrated sun, or electric, light in the treatment of lupus. The ultraviolet, or chemical, rays are selected on account of their bactericidal and penetrating power. Excellent results have been obtained, but the arrangements are complicated and expensive, only suitable to special institutions, and the treatment requires a long period of time. Heliotherapy, or stimulation and cauterization of the lesion by direct rays of the sun, is employed successfully by MacGowan.[1] "The patient sits or lies facing the sun. The operator stands in such a position that he can throw the sun's rays through the lens on the definitely diseased tissues, and change the focus at will and at the same time observe the tissues which are being treated. The eyes of the operator should be protected with dark glasses. All the neighboring parts should be protected with lead foil as is done in prolonged Röntgen ray exposures. The patch of lupus is alone exposed." The lens is so held as to be little out of focus, and for five to fifteen minutes, the concentrated sunlight is moved around the diseased area; finally the rays are accurately focused and passed slowly over the surface. When it assumes opalescent rings it is time to cease. Crust forms next day and drops off in two weeks.

The Röntgen rays have been employed for the same purpose. Schiff and Freund, of Vienna, have devised a procedure consisting of repeated exposures to weak radiation of definite strength, produced by a secondary current generated in an induction coil and energized by a weak primary current. A number of writers have reported favorably of this procedure, which has the advantage of acting much more rapidly than Finsen's method.

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[1] Journal of the American Medical Association, Aug. 31, 1907.

J. Goodwin Tomkinson[1] reports: "The x-rays are a very valuable addition to the dermatologist's armamentarium for the treatment of lupus vulgaris. Unfortunately, some cases appear at present, altogether irresponsive to their curative action; but on the other hand, there are cases which respond with relative rapidity and with the production of a cicatrix of high esthetic value. * * * Almost all are agreed as to the benefits resulting from the Finsen treatment in cases of limited extent, but the length of time demanded in the treatment of extensive areas considerably restricts its practical value in such cases. The older methods undoubtedly still play an important part in the therapeutics of cutaneous tuberculosis and, along with the newer ones, should be recognized, and employed as mutual adjuvants." The special remedies advised are syrup of iodide of iron, codliver oil, and saline aperients. Locally, a weak salicylic acid or iodoform ointment.

Emlyn Jones[2] finds that the non-ulcerated cases are best treated by the Finsen light, and are often cured by this means alone. The cases with ulceration are best suited to the x-ray. The hypertrophic cases are best treated with caustics, at first, and later with x-rays, like the ulcerated cases. Some cases require surgical treatment. Brocq advises a *mixed method*, a combination or alternation of scarifications and cauterization, the latter preferably by galvano-cautery. When scarification is no longer beneficial it is well to resort to cauterization. In this manner he believes that the cure is more rapid and the scars less disfiguring. The surfaces may be dressed with a solution of boric acid, corrosive sublimate, Vigo plaster, iodoform, or subcarbonate of iron. The advantages of electrolysis are that it is comparatively painless, there is no loss of blood or detention from business, no deformity or swelling produced, and the scar is smooth and not unsightly. Excision of the offending tissue is the most radical means. It is proper to resort to this only in comparatively small lupous patches, and plastic operations often become necessary. The resulting scar is usually very great, often markedly disfiguring, and the disease may reappear even in the transplanted skin. The treatment by erasion, or scraping with a sharp spoon or a dermal curette, as recommended by Volkmann, yields far better results than from excision. By means of this instrument only the diseased tissue is bored or scraped out. The pain attending the operation is often very great, and can be avoided by etherizing the patient, or lessened by freezing the part. A case has been reported by Klaus Hanssen in which a lupus of the lower lip had been aggravated and rendered exceedingly sensitive by the use of cauterants and the sharp spoon. By the application of ice, the pain was entirely removed within three days. At the end of several weeks a cure was effected. After mechanical treatment, the part should always be dressed with a soothing application, and the resulting scars are sometimes less disfiguring than those from the other measures already described. As it is almost impossible to reach with any instrument all the new growths in the tissues, it will always be safer to apply, after the erasion, some one of the caustics already named, so as thoroughly to destroy, if possible, all the remains of the disease. An instrument having an effect similar to that of the curette, but much more radical in its action, is the double-threaded screw used by Malcolm Morris. I witnessed the successful use of this instrument upon several cases of lupus in St. Mary's Hospital, London, the operator passing it rapidly into the lupus nodule, which it bores out, leaving the usually healthy external integument, thus avoiding scarring to any great extent.[1]

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[1] J. Goodwin Tomkinson: British Medical Journal, June 29, 1907.

[2] British Journal of Dermatology, Sept., 1907.

Hall-Edwards speaks very highly of the permanganate of potassium treatment, which was first suggested by Butte, for both lupus vulgaris and erythematosus. He uses a saturated solution, made by dissolving one drachm of the salt in an ounce of distilled water. In non-ulcerative cases, he first washes the patch with phenol or ichthyol soap, and afterwards wipes it over with a pledget of cotton wool, moistened with methylated spirit. When dry he applies the solution of potassium permanganate with a brush. In cases covered with crusts, the surface is cleansed as well as possible, without removing it, and the crusts themselves are saturated with the solution. The applications are repeated every day, or every other day, until relief is obtained. This treatment is especially adapted to the lesions which are spreading; it appears to have little or no effect upon indurated, non-ulcerative, slow-growing patches. The x-ray treatment may be also used. No permanent staining of the skin results from the permanganate.

Darbois and others[2] advocate the combined use of phototherapy and radiation, and report successful results.

Dr. Dreuw[3] declares that there is "no single method which can definitely cure every case of lupus, so that no recurrence will take place." He is convinced that on account of the time and expense involved in the Finsen light and x-ray treatment, these methods are only within the reach of a few specialists. Dr. Dreuw, in 1905, introduced a method of treatment for lupus vulgaris which places the general practitioner in a position to treat it cheaply, easily and with success. The method is as follows: The lupus patch to be treated is frozen with ethyl chloride, or by carbonic acid gas

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[1] The Medical Bulletin, September, 1884, p. 216.

[2] Soc. Française de Dermatologie et de Syphiligraphie, May 16, 1907.

[3] Lancet, July 13, 1907.

(or liquid air), till it is a snow white. Over this frozen surface crude hydrochloric acid is to be applied with friction, using a considerable degree of force. The application is made with cotton-wool wrapped around the end of a wooden stick about the size of a penholder. All the nodules should turn a greyish white color.

In a few cases, refrigeration by a spray of ethyl chloride has been successful. Hansen treated thirteen patients suffering with lupus vulgaris by this method and obtained a complete cure in two. In some of the others improvement occurred; but it was not permanent. Subsequent experience has made him declare that it is only exceptionally of advantage, in many cases the result was unfavorable (78 per cent.), and he advises great caution in its use, as it is liable to ultimately do harm. W. S. Hoy, of Wellston, Ohio, has had a number of successful cases resulting from keeping the lupous ulcer constantly moistened with oil of turpentine, applied upon picric acid gauze or absorbent cotton. Improvement is manifest from the first few days of treatment.

Dr. Brooke, of Manchester, reports it advantageous, before scraping, to employ a preliminary local treatment. For this purpose he recommends the following ointment:

| | | |
|---|---|---|
| ℞ Hydrarg. oleat. (2½ to 5 per cent.). | ℥j. | 32. |
| Acidi salicylici .................. | gr. x-xv. | 0.60-1 |
| Ichthyol ........................ | gr. xv. | 1. |
| Ol. lavandulæ .................... | q. s. | M. |

The preparation is applied, by inunction, for twenty minutes in the morning and ten in the evening. This method has been most successful in cases which have never been operated upon, but is also of use in relapses after previous scrapings.

Dr. Schütz, of Frankfort,[1] believes the reason why the scars resulting from the treatment of lupus are often so disfiguring is that the disease is scattered in the various layers of the skin, which heal at different rates. In order to equalize the healing process, this writer, after destroying the growth by means of curette or cautery, applies pyrogallic acid or chloride of zinc. When, under a sublimate gauze compress and bandage, the eschar is cast off, he covers the wound with a gutta-percha plaster-mull containing liquid phenol and mercury. The mull is then covered by a number of coats of collodion. This dressing is left in place from six to twenty-four hours, when it is removed, and reapplied after the wound has been cleansed. The cicatrix which finally forms is described as soft and mobile, and should be treated daily with massage, and rubbing with marble-powder and soft soap.

Erysipelas, caries, necrosis, and other complications that may arise, should receive appropriate treatment and be managed upon general principles.

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[1] Münch. medizin. Wochenschrift, November 6, 1888.

**Prognosis.**—As regards the general health of the patient, the prognosis is usually favorable. In the majority of cases, notwithstanding the long and persistent course of lupus, the patient may enjoy the best health. A rather large proportion of individuals having the disease die from tuberculosis of the lungs. The tissue can sometimes be restored to health, although the disease may be obstinate for some length of time and yield very slowly to the best treatment. Relapses are of frequent occurrence, and often set in when the affection is thought to be under perfect control. The more localized the disease, the more amenable is it to successful treatment, and likely to reach a favorable termination in cure. The scars which follow generally lead to marked disfigurement. An attack of typhoid fever may affect a cure of lupus, as in a case narrated by Lubliner. This result is in accordance with the occasional arrest of pulmonary tuberculosis by typhus fever or other acute febrile disease.

## SCROFULODERMA PHLEGMONOSUM—ULCERATING SCROFULODERM.

SYNONYM.—Scrofula.

Until within a comparatively recent period the term scrofuloderma was erroneously employed to designate all affections of the skin occurring in persons of scrofulous diathesis. It is, however, now generally admitted that the various forms of erythematous, vesicular, papular, and pustular eruptions that are occasionally developed during the progress of scrofula are merely incidental complications, not essential symptoms of that disease. The only cutaneous lesions that are characteristic of scrofula are those which were formerly described under the title of scrofuloderma phlegmonosum, or ulcerative scrofuloderm, and which are the secondary results of tubercular involvement of the subjacent lymphatic glands. The lesions usually occur upon the face and neck, but may also be observed upon the chest, back, and other portions of the body. They are preceded by hardening and enlargement of the lymphatic glands, which frequently attain the size of a large walnut, and become slightly sensitive to the touch. After a variable period of several weeks or months the lesions begin to soften and disintegrate, and the overlying skin assumes a reddened and then a violaceous color, becomes perceptibly thinned, more or less inflamed and painful. Fluctuation finally becomes pronounced, and one or more small openings appear on the surface of the tumefied glands, from which more or less thin, unhealthy, sanious pus exudes, containing usually tubercle bacilli and pus organisms. These openings gradually increase in size, and result in the destruction of the integument with the formation of a deep, unhealthy-looking ulcer, covered by a thin and firmly adherent brownish, yellowish, or grayish crust, under which disintegration of the glandular structure rapidly progresses. The formation of pus continues, and the crust breaks open from time to time. The ulcer grows slowly and imperceptibly deeper, and involves the subcutaneous cellular tissue. Its base is irregular, granular, and covered with pus and cell *débris*. Its edges also are irregular and are undermined, and possess the characteristic purple color. The ulcer ultimately, but very slowly, tends to heal by granulation and cicatrization, forming irregular and reticulated, puckered-up, unsightly scars, which are long subsequently perceptible on account of their red and purplish aspect, finally becoming white and glistening. Extensive ulceration may not always take place, but the characteristic violaceous color of the skin is for some time apparent, and an unsightly atrophied scar may form over the apex or centre of the swelling. The scrofulous ulcer may, however, take on unfavorable action and in crowded hospitals give rise to what Lebert and Guersant have described as scrofulous gangrene. This form of gangrene is non-contagious, and may occur without affecting other scrofulous patients in the same wards. It is accompanied with gastric disturbance, anorexia, diarrhea, and febrile symptoms. The ulcer becomes red, inflamed, intensely painful, and increases rapidly in size. If cicatrization has begun, the ulcer breaks down again, and its surface becomes covered with blood and pus, drying into thick, firmly adherent, dark-red or brown crusts. Extensive phagedenic ulceration of the subcutaneous connective tissue and the adjacent muscles and tendons may take place beneath the crusts. The resulting odor is offensive, but not so foul as in ordinary gangrene. The destructive process ceases, as a general rule, in eight or ten days. New and healthy granulations then appear and cicatrization rapidly ensues. In superficial scrofulous ulcers this gangrenous action is of little consequence.

**Diagnosis.**—Phlegmonous scrofuloderma can readily be recognized as such by its situation on the face or neck, its concomitant scrofulous lesions, and the tumefaction of the glands, to which, if violaceous color be added, no doubt can remain as to the nature of the disease. The chronicity and color readily distinguish the affection from simple ulcers of traumatic or idiopathic origin. The purple tint, irregular shape, and intractable nature of the ulcer will likewise differentiate the disease from the ulceration of tertiary syphilis. The lesions of congenital syphilis may, in truth, present a superficial resemblance to those of scrofula, but the age of the patient should assist in making a correct diagnosis, as true scrofuloderma is rarely found in infants.

**Pathology.**—The lesions of scrofuloderma are secondary to tuberculous involvement of the lymphatic system. The affected glands become infiltrated with lymph-cells and giant-cells, and are enormously increased in size. The pressure of the new cells gradually produces more or less obliteration of the minute capillaries and lymph-spaces, followed by various inflammatory or degenerative changes in the tissues that are deprived of nutrition. Ordinarily the glands become dotted with cheesy nodules, which gradually undergo softening or liquefaction. Exceptionally, the product of liquefaction is absorbed as soon as formed, and the gland gradually decreases in size. Usually, however, suppuration is excited in the adjacent tissues, and a cavity containing pus is formed. The inflammation then extends through the various layers of the skin, resulting in the destruction of the epidermis and corium, and the production of a typical, scrofulous ulcer.

**Etiology.**—Scrofula may occur in either sex and in all races. It may be inherited or acquired, but rarely manifests itself before the first or second year. When inherited, it may be due to phthisical or to scrofulous parentage. Scrofula is not the result of syphilis, but may coexist with it, however, in a mixed infection. It should not be confounded with the hereditary evidences of that disease.

Acquired scrofula is a form of chronic, local, tuberculous infection, and its progress is favored by any cause that impairs the nutrition of the system. The most potent factors in its development are insufficient and improper food, exposure to cold and damp, want of exercise and fresh air, deprivation of sunlight, or systemic depression produced by measles, scarlet fever, diphtheria, typhoid and typhus fevers, and other exhausting maladies. Scrofula occurs more frequently in the negro than in the white race, mulattoes being especially liable to it.

In a series of experiments undertaken by E. Madigliano,[1] of Pisa, in order to determine the relation between scrofulosis and tuberculosis, it was found that guinea pigs when inoculated with matter taken from human scrofulous glands became tuberculous, and the microscope revealed the presence of Koch's bacillus. These results are in accordance with the investigations of Dr. Victor B. Huebbenet, of St. Petersburg. In scrofulous glands removed from fourteen patients, whose ages varied from eight months to twenty-three years, tubercle bacilli were found, and inoculation with fragments of the tissue produced general miliary tuberculosis in the guinea pig.

**Treatment.**—The treatment of scrofuloderma is similar to that of tuberculosis in general, and consists of the employment of both constitutional and topical measures. Mr. Frederick Treves, of London, warmly recommends a long-continued residence upon the sea-coast, especially in those localities where large quantities of sea-weed are thrown upon the shore and exposed to the action of the sun. He insists also upon the importance of proper clothing, advising the skin to be covered with wool from the neck to the wrists and ankles. Medicinally, the sulphide and chloride of calcium, codliver oil, iodine, the iodide of iron, and other chalybeates, have been warmly recommended by various authors, and these remedies are certainly of great value in many cases. Unfortunately, they sometimes produce so much gastric disturbance that their administration must be suspended. The chlorate of potassium, I have found to be equal, if not superior, to any of those hitherto mentioned, and usually well borne by the stomach. The chlorate of potassium may be given alone, or in combination with any other antistrumous agent, with the effect of increasing nutrition and assimilation, promoting the oxidation of the tissues, and changing and improving the quality of the blood. Dr. Harkin, who has used it in tubercular as well as in scrofulous diseases, claims also that it increases the solid constituents of the blood, restores muscular energy, and produces even a tendency to plethora. The chlorate of potassium possesses a markedly restraining influence on all suppurative processes. The intumescence, and the violet color of the skin, rapidly disappear under its use, or, if suppuration has already occurred, the thin, unhealthy character of the secretion rapidly disappears. I have usually given this drug in doses varying, according to the age of the patient, from one-half to ten grains (0.03 to 0.60 gm.), dissolved in water, three or four times a day. I generally begin with from one-half to one grain (0.03 to 0.06 gm.), one hour before meals, and gradually increase the dose until the patient shows signs of improvement. If thus continued for some time the chlorate of potassium will increase the appetite, render a previously dark skin clear and florid, and add tone and vigor to the system. Those who are large, flabby, and apparently vigorous will improve, as a general rule, better under small doses; while, on the contrary, the pale and feeble bear much larger doses, often increasing rapidly in weight. Dr. Krasnogladoff, of Tiflis, has drawn attention to the *Delphinium consolida*, knight's-spur or larkspur, as of great popular repute in the Caucasus in the treatment of scrofulous manifestations. He narrates several cases in which this remedy proved beneficial. It is employed both internally and externally.[1] Another drug lately introduced, from which I have obtained good results, is the iodosulphate of cinchonine, from one to five grains (0.06 to 0.30 gm.) being administered three or four times a day.

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[1] Weekly Medical Review, Nov. 2, 1889.

The local treatment of scrofuloderma, with the view of promoting resolution, must be instituted early and carried out energetically, if a speedy cure, without hideous cicatrization, is to be expected.

Attempts at prophylactic treatment of the scrofulous lesions of the skin, are usually abortive, but we sometimes succeed in preventing the breaking down of tissue and consequent suppuration. The tincture of iodine, as well as the ointments of iodine and iodide of potassium, are of little value for this purpose. They usually irritate the inflamed skin still more, and hasten the issue rather than prevent it. Poultices and warm fomentations act no better, while cold applications are annoying and impracticable. Excellent results can be obtained, however, from the use of a solution of iodoform in oleic acid, applied lightly over the tumefied surface with a camel's-hair brush two or three times a day, which will frequently induce resolution without suppuration. Iodoform is non-irritating, while it possesses all the sorbefacient virtues of iodine. The oleic acid in which it is dissolved possesses superior penetrating powers, and will carry it deeper into the tissues than almost any other solvent. Oleic acid, which will not evaporate rapidly, like ether, also modifies in some degree the disagreeable odor of iodoform. Compression is likewise an effective means of promoting absorption and preventing the breaking down of the lesions. Strips of plaster have been used for the purpose, but they are not so effective as flexible collodion brushed over the surface every second day. The value of this application may be increased by saturating the collodion with iodoform. If this method be adopted in time, it will often produce a reabsorption of the nodule and prevent ulceration and the formation of unsightly cicatrices. Local treatment will, however, be comparatively useless unless constitutional measures be employed at the same time. Exercise, fresh air, sunlight, and plenty of nourishing food, are of paramount importance in all cases.

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[1] Therapeutic Gazette, April 16, 1888.

As soon as it is evident that suppuration has occurred, the pus should be evacuated through a small incision at the lowest point of the gland, or the point of fluctuation. The interior of the pus-secreting cavity should then be scraped with the sharp spoon and touched with tincture of iodine or with a twenty-grain (1.30 gm.) solution of silver nitrate, in order to induce the formation of healthy granulations. Prof. Hofmokl, of Vienna, prefers to stuff the cavity of a gland with iodoform gauze, which he removes when granulations begin to form.

In a communication to the Surgical Society of Paris, M. Reboul announced good results from the injection into scrofulous glands of camphorated naphthol. A cure was obtained in twenty-one of twenty-seven cases in which the glands were breaking down or in which suppuration had actually occurred. Seven or eight drops of the preparation were, with antiseptic precautions, thrown into the gland. If suppuration had already taken place, the cavity was first cleansed. The injections were repeated every other day, and cure resulted in from one to three months. Nélation likewise testified to the favorable action of naphthol upon caseous glands exposed by ulceration of the overlying skin. A tampon of naphthol placed upon the gland promoted resolution of it together with neighboring enlarged glands. When the swollen gland is softened and we have reason to believe that caseation or suppuration has occurred, total excision is an excellent practice. Union by first intention is the general result.

In truth the surgical extirpation of scrofulous glands is often a proper and beneficial procedure. In ninety-three of one hundred and forty-nine cases operated upon in the clinic of Tübingen and reported by Noorden, there was no return of the disease after periods varying from three to fourteen years. In thirty cases the glands again became affected, but in no instance did the disease return later than six years after operation. Noorden calculates that twenty-eight per cent. of all patients suffering with strumous disease of the glands, die of other forms of tuberculosis, of which the most frequent is pulmonary consumption. He concludes, therefore, that early extirpation lessens the danger of systemic infection. If the glands have broken down and the pus has passed through the integument, the undermined edges of the resulting ulcers should be trimmed off with the knife or scissors, the venous stasis should be removed by free scarification, and the crusts detached with a warm solution of borax in water, phenolized water, or a solution of potassium chlorate in water. The unhealthy, flabby granulations should then be destroyed by the application of either nitrate of silver, sulphate of copper, or diluted acid nitrate of mercury, or, perhaps better than either, by the galvano-cautery or stimulated by the x-rays, and the wound dressed with the ointment of nitrate of mercury, or the yellow oxide of mercury. Liquid air has a powerful effect in exciting healthy granulation, after curetting. Dr. Quénu recommends the application of a one or two-per-cent. solution of hydrofluoric acid by means of a tampon of absorbent cotton held in contact with the ulcer for five or six minutes. The treatment is repeated every second day until healthy granulations appear, and in the meantime the sore is dressed with cotton moistened in a phenolized solution. Instead of the above method, the ulcer may be advantageously scraped with the curette, and the cautery applied subsequently. If laudable pus appears and the surface assumes a healthier look, the ulcer may be dressed with powdered potassium chlorate, iodoform, subiodide of bismuth, or iodol dusted freely over the surface night and morning. Thymol iodide is another substance which may be employed with marked benefit. Europhen has also proved a useful topical remedy. While unsightly cicatrices can not always be prevented, they can be reduced considerably by the repeated application of tincture of iodine or collodion, or by gentle but continuous massage, with the use of galvanism and faradism. Scars which remain may often be removed by excision, freeing the edges of the wound and uniting them by means of sutures.

**Prognosis.**—The prognosis may be stated as ultimately favorable. It must be acknowledged, however, that the cutaneous lesions are frequently intractable, and, although they may not involve any actual danger to life, the long-continued suppuration may, together with the general nutritive impairment, produce the most serious systemic depression. If energetic treatment be adopted early, the disease may prove less obstinate than if permitted to pursue a chronic course. Scrofuloderma may terminate, in any event, in the formation of disfiguring scars—a result which should be anticipated, and the patient so informed. While cicatrices may to some degree be prevented by timely and proper treatment, they may yet occur in cases in which the inflammatory period has been shortened and suppuration almost entirely prevented.

TUBERCULOSIS VERRUCOSA (*Tuberculosis cutis*).—Tuberculosis of the skin distinct from lupus vulgaris is a rare affection.[1] Cases have been observed by Chiari, Jarisch, Kaposi, Gilchrist and Ortoerl and others. It is characterized by the occurrence of superficial ulceration, without any apparent cause, generally during the course of general tuberculosis. The ulcers vary considerably in size, are bright red in color, and round, oval, or irregular in shape. Their edges are slightly infiltrated, and their base is uneven, granular, and covered with a thin, yellowish secretion. They are slightly painful, but do not bleed readily when touched. The lesions manifest no tendency to heal, but slowly increase in size by peripheral extension. They usually appear upon the skin immediately surrounding the natural orifices of the body and upon the adjacent mucous membranes. In five cases observed by Chiari the lesions all occurred upon the lips. In two cases reported by Kaposi, the lips, the nose, and the pharyngeal and tracheal mucous membranes were the seat of ulcers of various shapes and sizes. In one case described by Jarisch the velum palati was covered with miliary degenerations, and a crescentic ulcer was situated on the left ear. On microscopical examination of the lesions, the corium is found to be infiltrated with lymphoid cells and masses of miliary tubercles in various stages of degeneration. Dr. Kraske has reported two cases of tuberculosis of the penis. In one, the urethra was ulcerated from the membranous portion to the neck of the bladder; in the second, a tuberculous ulcer was situated upon the dorsum of the glans. The source of infection could not be discovered. Tuberculous infiltration of the skin, followed by ulceration, is sometimes the result of accidental tuberculous inoculation of a wound. Infection has been traced to wearing the ear-rings of a consumptive, to injury by a vessel which contained bloody sputum from a subject of phthisis, to the rite of circumcision performed by a phthisical operator, and to washing handkerchiefs in which tuberculous sputum had been received. Tuberculous lymphangitis and lymphadenitis may ensue upon accidental inoculation. Cutaneous tuberculosis has been excited by the practice of tattooing when a consumptive operator has moistened the Indian ink with his saliva. Riehl and Paltauf have described a form in which the lesions appeared upon the fingers, hand, and forearm. The patients were, as a rule, males whose daily work brought them into contact with animals. Tuberculosis of the skin is likewise seen upon the fingers of those employed in dissecting-rooms, hospital-wards, and butcher-shops. Besnier and Vidal were the first to observe that it occurred in those who had been engaged in dissecting consumptives, or slaughtering tuberculous animals. It has been described under the titles of anatomical tubercle, *tuberculosis verru-*

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[1] See paper by the author on "Tuberculosis of the Skin." Journal of Cutaneous and Genito-Urinary Diseases, March and April, 1890.

*cosa*, and *verruca necrogenica*. Its progress is extremely slow, and systemic involvement is long delayed. The patch is of small size, raised a little above the surface, round, oval, or serpiginous, and surmounted by wart-like growths. Surrounding such a patch is a brownish or livid zone within which isolated pustules are scattered. External to the zone of pustules succeeds one of erythema. A little pus is found in the fissure between the warty outgrowths, but there is no tendency to ulceration.

This lesion has been observed, not infrequently, upon the dorsal surface of the right thumb of consumptives, probably acquired by wiping the mustache upon the hand.

A singular cutaneous tuberculosis has been observed by Heller in a child whose body was covered with macules, papules, vesicles, and bullæ consecutive to the development of cheesy glands adherent to the right innominate vein. Bacilli were found in the contents of the vesicles and in sections of the diseased tissues. The tendency of the investigations actively prosecuted since the publication of the first edition of this work is to demonstrate that tuberculosis of the skin manifests itself in a number of distinct forms, and that lupus vulgaris and scrofuloderma are all etiologically related, as all are dependent upon the activity of the bacillus tuberculosis. In an address upon the subject, Prof. James C. White has reported[1] ten cases, the ages of the patients varying from nine months to sixty-three years, in which different clinical forms concurred in the same individual.

The investigations of Dr. Nikolai Blagoveshtchensky, of St. Petersburg, upon the histology of apparently healthy skin in general tuberculosis may be mentioned with advantage in connection with this subject. He found, on examining pieces of skin taken from different parts of the trunk and limbs, more or less constantly, an infiltration of leucocytes into the lymphatic spaces, with enormous dilatation of these spaces; the capillaries were intensely engorged, and in some instances minute extravasations had taken place; in others the vessels were surrounded by an accumulation of leucocytes. The Malpighian layer was atrophied, the epithelium of the sudoriparous glands was swollen, and was undergoing degenerative changes.

I had the honor of presenting a patient, a woman 43 years of age, to the Section on Cutaneous Medicine of the American Medical Association, in 1907, who had met with a fracture of the nose, which had subsequently become accidentally infected with tuberculosis. The lesion first appeared as a papule upon the left side of the nose, which subsequently ulcerated, and the ulcer spread quickly to the left cheek and upper half of the lip. Later, it spread to the tip of the nose and over to the cheek. It involved the entire nose, causing destruction of the cartilage and deeper tissues. The lungs were apparently normal. Microscopic examination of tissue sections revealed the tubercle bacilli. She had been treated with antisyphilitic remedies before I saw her, but without effect. In truth, there was no history or evidence of syphilitic infection. She improved very much upon hygienic treatment, tonics, and arsenic. Locally, the following was found useful in relieving pain and reducing discharge:

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[1] "Clinical Aspects and Etiological Relations of Cutaneous Tuberculosis." Boston Medical and Surgical Journal, November 12, 1891.

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| ℞ Creosoti (Beechwood) .............. | ♏ x. | .65 |
| Atropinæ sulphatis .................. | gr. ij. | .13 |
| Cocainæ hydrochloridi ............... | gr. v. | .32 |
| Liquor. calcis ...................... | f℥iv. | 120. |

M. Sig.: Apply locally on a cloth.[1]

Radium has likewise been highly recommended for the treatment of tuberculosis of the skin. Wickham and Degaris state that the results obtained with radium treatment of tuberculous cutaneous affections justify high hopes. The results of injection of solutions of salts of radium have also proved encouraging. One great advantage of radium is that it can be applied in a form to adapt it to the part to be treated.

Tuberculous Scleroderma.—Milian, in a communication to the "Société Médicale des Hôpitaux."[2] calls attention to the presence of tubercle bacilli, and tubercle lesions, in certain cicatrices after tubercular infection of the skin. Some of these have the clinical appearances of scleroderma, and this may be seen at the fistulous openings of the bone lesions, also in lupus vulgaris, or in erythematous lupus. The glossy skin appearance following ulcers of the leg is of the same character, according to this observer. He found that two patients, who presented this condition, both reacted to tuberculin, and also that fragments of the skin when transplanted into a guinea pig caused general tuberculosis. Ulcers of the leg with glossy skin are therefore a variety of tuberculous scleroderma.

## MOLLUSCUM EPITHELIALE.

**Synonyms.—Molluscum contagiosum—Molluscum sebaceum—Molluscum verrucosum—Epithelioma molluscum—Condyloma subcutaneum—Molluscum sessile—Tumeurs folliculeuses—Acne varioliforme (Bazin).**

Molluscum epitheliale is a disease of the upper layer of the skin, characterized by the formation or firm, rounded, semi-globular, or wart-like papules and tubercles, from the size of a pin-head to that of a pea, which present a whitish, translucent, or pinkish tinge.

**Symptoms.**—The disease begins as small, round, prominent tumors, which may rapidly or slowly attain the size of a split pea, or become as large as a hazel-nut. The larger lesions are generally pedunculated and the smaller sessile. In color they may have the appearance of the skin of the region affected, or they may have a pinkish, waxy, or glistening look, the later effect being due to the stretching of the skin of the part. Their appearance has been likened to pearl shirt-buttons. They may occur singly, but are usually met with in numbers, in all stages of development. The tumors are flattened on the summit, with slight depression, in the centre of which, as a rule, black points can be seen—the openings of the follicles. Their consistency is generally firm, but this, of course, will vary with the condition of the contents. The wall of each lesion is thick, but moderate pressure will cause the contents to escape in the form of a white, semi-fluid substance. The lesions are generally slow in development, and rarely attended with any subjective symptoms. They are at times accompanied with inflammation, especially if torn and irritated by scratching. The disease generally occurs on the face, especially the eyelids, cheeks, and chin. It has been known to invade the vermilion border of the lips. The neck, breast, and genitalia are frequently invaded, and any part of the body may be attacked, except the palmar and plantar surfaces. The tumors are usually confined to a limited area, are occasionally grouped, but seldom affect the whole body at the same time. In rare instances a generalized form of the disease has been encountered, the lesions being either discrete or conglomerate.

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[1] Journal of the American Medical Association, Sept. 14, 1907, p. 942.

[2] La Clinique, March 29, 1907, p. 205.

**Diagnosis.**—The disease is usually easily recognized, and is perhaps liable to be mistaken only for *molluscum fibrosum*. In molluscum epitheliale the lesions about the face are few in number, while in molluscum fibrosum they are many, and also are frequently found over the body. The tumors of molluscum epitheliale, moreover, are, although prominent, superficial, while those of molluscum fibrosum are deep-seated. Again, in molluscum epitheliale a minute black point, the opening of the follicle, is generally visible in the lesions, but in molluscum fibrosum no appearance of this kind is observable. Lastly, molluscum epitheliale is generally a disease of childhood, while molluscum fibrosum is an adult affection.

**Pathology.**—The observations of Virchow, which are with reference to this disease the most generally accepted, go to show that it begins in the hair-follicles from a hyperplasia of the epidermis lining them. Thin and Robinson corroborate Virchow. Geber's investigations indicate how the rete cells become changed. He says: "I have become convinced that the large number of the altered rete cells pass directly and uninterruptedly into the condition of cornification, and that a smaller number are converted into molluscum corpuscles, after their cloudy, granular contents have changed into homogeneous, transparent hyaline substance. Only a narrow zone of the external part of the body of the cells undergoes cornification. The fully developed molluscum corpuscles consist, therefore, of two substances—namely, a central hyaline and a peripheral keratoid substance."

Leloir and Vidal, however, in their recent work,[1] maintain that the *culs-de-sac* of the sebaceous glands are the point of departure of the morbid process. According to their sections the tumor, in its earliest stage, consists of a series of lobules corresponding to these *culs-de-sac*. The molluscum corpuscle is probably due to the invasion of the Malpighian cell by a psorosperm, which attacks a certain number of the cells of the deepest portion of the lobule.

**Etiology.**—Molluscum epitheliale is a rare disease and is evidently of a parasitic nature. It occurs mostly in the poor, especially in children improperly fed, who also do not receive general care, and is met with only rarely in children of the better social classes. The exact cause of it has not been settled satisfactorily. Molluscum epitheliale frequently attacks several members of the family at the same time, and on this account is thought to be contagious. Although inoculation has generally failed to reproduce the disease, yet three instances of positive success are on record, and suffice to prove the contagious character of the affection. In these experiments the period of incubation varied from three to more than six months. Geber states his belief that it is due to predisposition of the rete cells to proliferation, and that in a considerable number of cases local irritants act as exciting causes. Bodies which have been discovered in sections made from molluscum epitheliale have been regarded by Darier and others as coccidia. This disease has consequently been included by Darier in a class which he terms cutaneous psorospermosis. The class includes also Paget's disease of the nipple and epithelioma, in all of which the growth of coccidia is presumed to be the exciting cause. Neisser considers the disease as a form of epithelioma, and prefers the name epithelioma contagiosum. He regards the molluscum corpuscle as a completely cornified epithelial cell filled with the parasite.

**Treatment.**—Only local applications are effective. The lesions, especially if numerous, may have applied to them some stimulating preparation, such as tincture of green soap, sulphur, white precipitate, or naphthol ointment, or lotions containing alum, sulphate of zinc, sulphate of iron, or corrosive sublimate. Other astringent or irritant solutions may be used at discretion. Dr. Jamieson applies pure liquid phenol to the lesions, and afterward brushes them with flexible collodion. He finds that this procedure usually causes rapid disappearance of the tumors, and only occasionally is a second application necessary after an interval of ten days. If the lesions are few in number, they may be squeezed, scraped out, ligated, or cut out with the knife. The most simple and effective means of destroying the lesions is to incise their apices, and afterward, with forceps, to force or tear out their contents, including the cell-walls. The cavity and base should afterward be cauterized, nitrate of silver being generally employed for that purpose. The tumors can also be removed by ligating them and cauterizing their bases. Small tumors may be effectually destroyed by means of the thermo-cautery.

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[1] *Op. cit.*, p. 33 *et seq.*

**Prognosis.**—The disease inclines to spontaneous recovery. Proper treatment is followed by the complete removal of the lesions, unless they have not been thoroughly destroyed, in which event the growths are liable to return.

## LEPRA.

Synonyms.—Elephantiasis Græcorum—Leontiasis—Lepra Arabum—Der Aussatz—La lèpre—Spedalskhed—Leprosy.

Lepra is a chronic, malignant, contagious, constitutional disease, parasitic in origin, and characterized by various morbid alterations in the cutaneous, nervous, muscular, mucous, and osseous structures, producing hyperesthesia, anesthesia, ulceration, necrosis, general atrophy, debility, deformity, and death.

**Symptoms.**—Lepra is a constitutional disease that involves the entire system, and manifests its presence by general as well as by local symptoms. It is extremely chronic in character. Many years usually elapse between the first appearance and the termination of lepra, but its progress, while slow, is relentlessly certain. Every organ of the body is finally invaded and every function affected, so that its unhappy victims eventually perish from inanition, unless they be previously carried off by some intercurrent disease.

No definite period of incubation is characteristic of leprosy. In some instances eight or ten years had elapsed since the patient had dwelt where leprosy prevailed, and Dr. P. S. Abraham has cited the case of a man who became leprous though he had not been out of London for more than thirty years. In his youth he had been a sailor in the Mediterranean. It is true that he might in some unknown manner have been exposed to contagion while living in London, since the case is reported of a woman who lived and worked in that quarter of the city frequented by sailors, and in whom leprosy developed notwithstanding the fact that she had never been beyond the bounds of the United Kingdom in her life. Hallopeau has had under his care a man in whom the first signs of leprosy occurred thirty-two years after a residence of fifteen months in Martinique. König relates the history of a case in which the first symptoms manifested themselves nine years after exposure. The usual period of incubation, perhaps, is from three to five years.

Lepra is almost always preceded by premonitory symptoms, which, however, are indefinite in character and present no special significance except in regions where the disease is endemic. They consist of general *malaise,* loss of appetite, gastric disturbances, nervous prostration, excessive somnolence, irregular attacks of fever, and wandering pains in the bones. The symptoms may present themselves months before the actual outbreak of the disease. A significant one which frequently appears during this prodromal period is the development of a bullous eruption. This eruption can readily be distinguished from that of pemphigus, from the fact that only a few bullæ are present at a time, and that no new lesions develop until the old ones have disappeared. Another prodromal symptom which, according to Dr. D. B. Simmons, is regarded in Japan as pathognomonic of the disease is an unusually deep flushing or lividity of the face after moderate indulgence in vinous or spirituous liquors. Febrile attacks which occur from time to time without any apparent cause are also significant, and may be mistaken for malaria by those who are unacquainted with the insidious manner in which lepra makes its approach. Among other early manifestations of the disease, Sir William Moore mentions the occasional occurrence of slight enlargement of the ear-lobes, atrophy of the ball of the thumb, affection of the gums resembling mild scurvy, very slight desquamation under the ends of the nails, and anesthesia of the tip of the little finger. According to the same observer the disease in some instances commences by ulceration of the fingers or toes without preceding macules, tubercles, or anesthesia, by the exuviation of fingers or toes with very little, if any, discharge, or by absorption of articulating surfaces with consequent anchylosis. According to Dr. Hillis, symptoms which precede an unmistakable outbreak of leprosy are rheumatoid pains in various portions of the body, tenderness of the skin, and lancinating pain along the course of certain nerves. This pain is increased by pressure, and gives rise to sensations resembling electric shocks. Again, dryness of the nose, epistaxis, vertigo, headache, increased or diminished activity of the sudoriparous and sebaceous glands, pruritus, and menstrual difficulties have been enumerated among the premonitory symptoms. More characteristic symptoms develop sooner or later, and dispel any doubt that may have remained as to the true nature of the malady. The cutaneous lesions are usually the first to appear, and they remain prominent until the end. According to Marcano and Wurtz the first manifestation of lepra is, in many cases, an isolated macule having no specific characteristics, except anesthesia on its surface and in its vicinity. Disturbances of the peripheral nervous system are also of frequent occurence, and in some cases may be the only manifestations of the affection. Every organ of the body, however, is finally invaded by the disease. It was formerly supposed that there were only two varieties of lepra, the tubercular and the anesthetic, but Kaposi and others have demonstrated that there are three—the *tubercular,* the *anesthetic,* and the *macular.* No exact lines of demarcation, however, separate these varieties. The disease may begin with the symptoms of any one of these three forms, but sooner or later the characteristic features of the other varieties also manifest themselves. The classification given is convenient, however, for purposes of observation and description.

Lepra Tuberculosa.—Tubercular lepra, is characterized by the development of macules and tubercles upon the cutaneous and mucous surfaces. The macules are the rėsult of the deposition of new material in the superficial tissues. They are usually well defined, but may fade imperceptibly into the surrounding healthy surface. They vary from a quarter of an inch to several inches in diameter, are irregular in shape, smooth, and glistening, and vary from pale red to dark brown. The lesions are firm to the touch, and slightly painful on pressure. When they first appear they are on a level with the adjacent surface, but soon become raised. They may develop upon any region, but are most abundant upon the back and the extensor surfaces of the upper and lower extremities. The lesions are frequently met with on the buttocks, palms and soles, and the forehead and cheeks. Occasionally some of the patches undergo complete involution, and the skin resumes its natural color. At this stage, as well as at a later period, it is not unusual to observe attacks of an eruption identical in appearance with that of erythema nodosum, accompanied by considerable elevation of temperature. Large but transient tumefactions in the course of the limbs, swellings of the joints, and erysipelatoid redness, have also been witnessed by Brocq. The majority of the lesions, however, increase in breadth and thickness, and produce extensive and prominent elevations of the surface. The skin then appears to be uniformly discolored, and divided into irregularly shaped masses. Finally, as the process of infiltration continues, more prominent and distinctly limited elevations, termed nodules or tubercles, are formed. The tubercles are round or oval, and vary from the size of a split pea to that of a walnut, or may be larger. They are generally brown or dark red in color, more or less painful upon pressure, and are usually developed upon those regions of the surface that have been the seat of infiltration, but they may appear upon apparently healthy skin. The tubercles are frequently surrounded by an inflammatory or an edematous areola. They are found upon the back, buttocks, arms, legs, fingers, and toes, but are most abundant upon the forehead, cheeks, eyelids, nose, lips, chin, and ears. The deformity which they produce is so characteristically hideous that, once seen, it can never be forgotten. The face is broad, swollen, discolored, and presents an inexpressibly sad appearance. The skin of the forehead is thickened and thrown into deep folds, which in some cases give a fierce or sullen aspect to the countenance (facies leonina). The nose is broad, flat, and covered with tubercles. The eyelids and cheeks are thick and pendulous; the chin is broad and swollen; the lips are thick and infiltrated; and the ears are enlarged and indurated. The hairs of the eyelashes and eyebrows are scanty or absent, and those of the beard are thin and lanuginous. The hands and feet are also horribly deformed. The hands are swollen, discolored, and covered with tubercles and masses of infiltration. The fingers are thickened, fissured, and clubbed at the ends. The thickening and induration, which are especially marked bones. The symptoms may present themselves months before the actual outbreak of the disease. A significant one which frequently appears during this prodromal period is the development of a bullous eruption. This eruption can readily be distinguished from that of pemphigus, from the fact that only a few bullæ are present at a time, and that no new lesions develop until the old ones have disappeared. Another prodromal symptom which, according to Dr. D. B. 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After the tubercles have become fully developed they remain for a varying length of time without further change. During this period the general health is usually unaffected and the mental faculties are unimpaired. In rare instances the disease is spontaneously arrested at this stage, and the existing tubercles disappear by absorption, leaving an atrophied, pigmented spot to mark their location. In the overwhelming majority of cases, however, the morbid process eventually receives a fresh impetus, new tubercles are developed, and the old ones become the seat of an erysipelatous inflammation, break down and ulcerate. The tubercles may also ulcerate as the result of pressure, friction, or other injury, and may exist for years without extending in breadth or depth. In many cases, however, the ulcerative process extends rapidly and deeply. The skin and the subcutaneous tissue are first destroyed, the muscles, tendons, and ligaments are also invaded, the joints opened, and the affected parts separated. This is the condition known as lepra mutilans. It is usually confined to the fingers and toes, but has been observed on the wrists and ankles. It sometimes attacks all the phalangeal joints in succession. After the necrosed tissue has been thrown off, the proximal ulceration heals by the formation of a cicatrix. In some, the middle phalanx of a finger or toe is alone affected, while the first and third are left intact. In these cases, after the necrosed tissue has sloughed away, the third phalanx is retracted against the first, and a varying degree of distortion or deformity results. Each exacerbation of the disease is followed by a period of quiescence, during which the patient is comparatively comfortable, and may even believe that he will finally recover. His nutrition and mental faculties are still well preserved, and the only troublesome or annoying symptoms present are those produced by the cutaneous lesions. Fresh accesses, however, occur from time to time, during which the eruption of tubercles becomes more extensive and the ulcerative processes more destructive. The mucous membranes may become involved, and tubercles appear in the mouth, nose, throat, larynx, and upon the tongue, epiglottis, and conjunctiva. When the tubercles break down, extensive ulceration and destruction of tissue result. The nasal bones may be necrosed, the nose sink in, the uvula and the epiglottis may be partially destroyed, and the voice becomes toneless and harsh. The tongue may become infiltrated, swollen, fissured, and edema and ulceration of the glottis may occur. Ulceration of the conjunctiva and cornea, with destruction of the iris, and partial or complete loss of vision, may also result. Atrophy of the testicles may be noticed at this stage of the disease. Irregular attacks of fever are likewise of frequent occurrence, and announce the invasion of some internal organ by the disease. Finally, mental symptoms appear, and the whole organization is profoundly involved. The patient becomes listless and helpless, and loses all interest in himself and his surroundings. His eyes are dull and staring, and the whole expression of his countenance is indescribably despondent. All desire for food is lost, bed-sores form, profuse diarrhea sets in, and the patient perishes from inanition. In some cases the fatal termination is accelerated by an intercurrent attack of pneumonia, albuminuria, tuberculosis, or some other acute disease. In others, after the tubercular eruption has existed for several years, bullæ are developed from time to time, limited patches of the skin become destitute of sensation, the tubercles disappear, and the symptoms of tubercular lepra gradually become merged into those of the anesthetic type. Norwegian physicians believe that this is the natural course of the disease, and that every case of tubercular lepra would eventually be transformed into the anesthetic variety if not anticipated by the death of the patient. The average duration of a case of tubercular lepra is from eight to twelve years.

LEPRA ANESTHETICA.—Anesthetic lepra, or the lepra nervorum of Virchow, may appear in conjunction with the tubercular and macular varieties, but it frequently occurs as a primary and distinct form of the disease. It is preceded by a number of prodromal symptoms, the most significant of which are the formation of bullæ and the development of hyperesthetic areas in the cutaneous surface. The bullæ are few in number, and vary in size from a bean to that of a walnut, or may be even larger. They contain a clear or yellowish fluid, and remain for a few hours or a few days. They then break spontaneously and their contents escape, after which the epidermis at their site desquamates and a white or pigmented cicatrix is formed. Other crops of bullæ appear and disappear in the same manner, and no other symptoms of lepra may become apparent for years. Occasionally patches of discoloration or other anomalies of pigmentation may be noticed. Sooner or later, however, the cicatricial or pigmented spots that mark the location of former bullæ become exquisitely sensitive. The areas of discoloration and portions of apparently healthy skin also becomes hyperesthetic, the slightest touch producing the most intense suffering. In some cases the whole cutaneous surface may be affected so that motion of any kind is painful or impossible. The patient is compelled to lie in bed, and must be fed like a child, as he is unable to help himself. During this stage of the disease the ulnar, median, radial, and other subcutaneous nerves are swollen and extremely painful under pressure. The hyperesthetic portions of the skin become reddened or slightly edematous, and are the seat of sharp, lancinating pains. In some cases the patient complains much of formication, or of a sensation of heat and burning in the extremities. This condition may last for months, but finally the pains and hyperesthesia subside, and the patient imagines that he is getting well. Other and more serious symptoms soon appear and dispel this delusion. Anesthesia succeeds to hyperesthesia, and the formerly supersensitive areas become devoid of all sensation. Portions of the apparently normal skin become affected in a similar manner. Sensibility to touch, pressure, and changes of temperature are entirely lost, and, although a transient improvement may occur in some cases, anesthesia eventually becomes complete over extensive portions of the cutaneous surface. The anesthetic areas do not correspond to any definite nervous distribution. They vary in size and shape, and may be found upon any portion of the body.

As the morbid process continues, the subcutaneous structure also becomes involved, so that a pin can be thrust deep into the muscles without producing any pain. M. Quinquaud, at the meeting of the French Society of Dermatology and Syphiligraphy, held in May, 1890, detailed the results of special studies which he had made of the sensory disturbances in the early stage of lepra. For this purpose he had devised an instrument which he called the dynamometric esthesiometer. This instrument registered the pressure in terms of grammes, and he was able to exert upon the skin a force amounting to two hundred and fifty grammes. He found that sensibility to pressure is very variable. In one spot there might be found sensation upon pressure of five grammes, while not more than two millimetres away one hundred grammes would be necessary to elicit a distinct sensation. "The same difference was found in regard to sensibility to temperature, which sometimes exhibited a considerable diminution. In some cases the thermometer marked 30° C. before any sensation was observed. Beside points where 0° C. was perceived, others would be found in which 10° C. was not perceived. Again, phenomena of dissociation were witnessed. Some had no perception of cold, but felt heat, etc. These modifications of sensibility were met with even in the earliest periods of the disease."[1] This dissociation was remarked in a case reported by Dr. George W. Jacoby to the meeting of the American Neurological Association, June, 1889. The patient was a youth aged eighteen, in whom large territories of pronounced analgesia existed. The sense of touch was normal, but there was no sensibility to pain. In certain parts there was complete loss of temperature sense. The distribution of the territories characterized by disordered temperature sense was much more symmetrical than that of the areas of analgesia. Neither the analgesic areas nor those with disturbed temperature sense corresponded to the distribution of particular cutaneous nerves. Although sensibility to pain and temperature was abolished in the same areas, yet the loss of temperature sense affected territories which were normal in other respects.

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[1] Le Progrès Médical, May 10, 1890; Medical Bulletin, July, 1890, p. 252.

Other trophic changes finally occur. The subcutaneous fat disappears, and the skin over the anesthetic areas grows dry, thin, and wrinkled. The sweat-glands and hair-follicles are absorbed or destroyed, and the hair falls out over the entire body. The finger-nails become fissured and brittle, and drop off or crumble away. The facial muscles atrophy, and the countenance, which at first presented an expression of mingled sadness and despair, is hideously distorted. The eyelids droop, so that the tears escape and flow down on the side of the face. The lower lip hangs pendulous and everted, exposing the gums, and allowing the saliva to dribble out of the corners of the mouth. The muscles of the hands and feet also atrophy; the hands are bent and deformed, and the fingers flexed and distorted; the toes are twisted in various directions, so that walking is difficult or impossible, and the patient at last is unable to leave his bed. After a time, owing to the pressure of the bony prominences on the skin around the joints, the epidermis becomes fissured and desquamates. Superficial ulcerations are then formed, which gradually involve the deeper structures. Muscles, tendons, and ligaments are destroyed, articulations are opened, and a phalanx, a hand, or a whole foot is separated from the body. This is the process known as lepra mutilans, and is identical with that which occurs in the later stages of lepra tuberculosa. The mucous membranes are also attacked by indolent ulcerations that produce extensive destruction of tissue, followed by loss of voice, sight, and smell.

Dr. Castor states that out of two hundred and thirty-one cases in which the mucous membrane of the mouth and pharynx was examined, anesthesia was present on both sides in ten per cent. while in only a very few cases was it found limited to one side. Intercurrent attacks of erysipelas and leprous fever are common. Finally, the central nervous system becomes involved. The patient sinks into a state of profound apathy, remaining motionless for days at a time. His temperature is diminished, the heart's action feeble and slow, and the breathing shallow and irregular. The immediate cause of death is usually inability to take sufficient food to prolong life, but diarrhea, pneumonia, or Bright's disease often puts an end to the patient's sufferings before that stage is reached. Anesthetic lepra is the most chronic variety of the disease, and generally lasts fifteen or twenty years from the first appearance of its symptoms.

LEPRA MACULOSA.—The macular variety of lepra is usually preceded by a number of indefinite prodromal symptoms, after which the characteristic macules make their appearance upon the skin. In many cases they appear without any accompanying constitutional symptoms, so that patients become aware of their presence only from accidental observation. In others, however, the lesions develop during a febrile attack. They differ in size and color, in some cases consisting of pale-red discolorations, (which vary from half an inch to several inches in diameter, and disappear under pressure); and in others, of dark-brown or black stains; in rare cases they are white and glistening. The macules are usually slightly elevated above the surrounding surface. They may appear on any portion of the body, but are usually most numerous on the face and hands, where they form a striking contrast to the adjacent normal skin. After a variable length of time the symptoms of one of the other forms of lepra appear and tubercles develop, or the macular areas become the seat of hyperesthesia, anesthesia, atrophy, and ulceration, after which the disease pursues its usual course. Attacks of erysipelas and leprous fever are noticed from time to time, more or less destruction of tissue occurs, and death, by gradual inanition or some intercurrent disease, finally closes the scene.

In some cases of leprosy the tendon reflexes are increased. Dr. Jacoby found the patellar reflexes much increased upon both sides. The same observation was made by Rosenthal, Vallin, and Rosenbach, while Schulze failed to find any abnormal deviation. Mr. Suzuki, of Tokio, Japan, found increased reflexes in twenty-three cases of leprosy, including both the anesthetic and tubercular forms.[1] Dr. Lopez, of Havana, has made ocular leprosy the subject of a memoir, which may be condensed as follows: In half of the lepers under treatment in the St. Lazarus Hospital at Havana the eye was attacked. The lids in particular are nearly always affected. They are subject to tubercles, and also to anesthetic patches, upon which the temperature is lowered and the glands destroyed. Ectropion is frequent, and may involve either lid. Destruction of nerve-filaments leads to paralysis of the orbicularis palpebrarum. Anesthesia of the conjunctiva is frequent in all varieties of leprosy. Conjunctivitis may result from foreign particles which the membrane, deprived of sensibility, is unable to recognize; hence the offending substance may remain and give rise to inflammation. Conjunctivitis may also be due to tubercular deposit. Pterygium is also sometimes produced. The lesions of the cornea are frequent and various. Anesthesia is the most common alteration. Tubercles may form upon the cornea and lead to destructive inflammation. Corneal staphyloma may develop, and be followed by atrophy of the cornea. Tubercle may be deposited in any part of the iris, but its favorite location is the arterial circle of the iris, whence it may invade the cornea, sclerotic, iris, and ciliary processes. The iritis of leprosy is insidious, characterized by relapses and exacerbations. Lesions of the crystalline lens are secondary to invasion of the ciliary region. The choroid and retina are less frequently involved than the more superficial membranes, though they may be attacked at a late stage of the disease. Leprous manifestations generally proceed from the surface to the interior. Keratitis and iritis are the most common causes of loss of vision.[2] In some cases the perspiratory function of the skin is gradually lost.

**Complications.**—As lepra is a disease of such extreme chronicity, various complications of the cutaneous lesions may be expected to occur. Those which have been most frequently observed are erysipelas, elephantiasis Arabum, syphilis, scabies, favus, eczema, fibroma molluscum, and herpes.

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[1] Lancet, July 27, 1889.

[2] Recueil d'Ophthalmologie, July, 1890. Medical Bulletin, November, 1890.

Dr. Beaven Rake, Medical Superintendent of the Trinidad Leper Asylum, narrates a case in which a lesion characteristic of Addison's disease, together with evidences of old syphilis, were found in a leper. The subject was a Hindoo, fifty years of age. The skin was very dark, but not darker than that of many East Indians. The pigmentation was evenly distributed, and neither the groins nor the axillæ were deepened in color. After death there was found darkening of the pia mater over the medulla and upper part of the cord and of the dura mater over the superior longitudinal sinus. The supra-renal bodies were converted into sacs, lined with brown *débris* and small yellow grains resembling minute tubercles. The medullary portion had disappeared. The ganglia of the aortic plexus were about three-quarters of an inch long, and dark red in color. No lepra or tubercle bacilli were discovered in the supra-renal glands or in the abdominal sympathetic, nor were any tubercles found in the lungs or any other portion of the body. Sir William Moore states that he has several times seen ainhum associated with leprosy, and looks upon it as one of the manifestations of the latter disease. The internal complications are numerous and varied, but do not require any special description. Those which occur most frequently are pneumonia, pleurisy, pericarditis, peritonitis, nephritis, hepatitis, enteritis, and colliquative diarrhea.

**Diagnosis.**—The symptoms of a fully developed case of lepra are so characteristic that an error in diagnosis is almost impossible. The hideous countenance, the infiltrated and discolored surface, the tubercular eruption, the cutaneous hyperesthesia followed by anesthesia, the ulcerations, atrophy, and deformity that occur from time to time, the history and extreme chronicity of the lesions, all unerringly indicate the true nature of the malady. The diagnosis is more difficult in the prodromal stages of the disease. In Japan, the deep lividity of the face, occurring after even moderately imbibing vinous or spirituous liquor, and at the very beginning of the affection, is regarded as pathognomonic, and sufficient to justify the isolation of the person in whom it is observed. Apparently causeless febrile attacks, and the persistent recurrence of a limited number of bullæ, should also be viewed with suspicion. With these exceptions, however, the premonitory symptoms are so indefinite in character that they would not excite alarm except in localities where the disease is endemic. The development of the cutaneous lesions in only a question of time, however, and their appearance is usually sufficient to enable one to make the diagnosis. In some rare cases the macules and tubercles may be confounded at first with those of *syphilis*. They differ, however, from the latter in being larger and more irregular in shape and distribution, the erythematous macules of lepra being often several inches in diameter.

They are also smooth and glistening in appearance, and raised above the level of the surrounding skin, are situated on an infiltrated base, and are often as large as walnuts. They also differ in progress and duration from the macules of syphilis.

The macules of lepra have been confounded with those of *vitiligo*. This mistake can readily be avoided by remembering that vitiligo consists only of a deficiency of pigment in a circumscribed area of the skin, with a slight increase of pigment around the borders of the altered area. The general health in vitiligo is unaffected, and the skin remains normal in texture and sensation. In lepra, on the contrary, the affected areas are infiltrated and elevated above the adjacent surface, and are also the seat of various disorders of sensation. *Morphea*, which was formerly supposed to be a benign variety of lepra, can be differentiated in a similar manner. Its patches sometimes resemble those of lepra in appearance, but they are normal in sensibility, unaccompanied by constitutional symptoms, and tend to spontaneous disappearance. *Sarcoma* and *elephantiasis Arabum* have been mistaken for lepra, but their symptoms and progress are so different from those of the last-mentioned malady that it is difficult to perceive why error should have arisen. In any doubtful case the blood from the suspected lesion should be examined, in order to determine the presence or absence of the specific bacillus of lepra. Zamboaco has argued that *Morvan's disease* is essentially identical with leprosy, but the lepra bacillus has not been found in the former affection, nor are the alterations in the peripheral nerves characteristic of leprosy present in the malady described by Morvan. The loss of phalanges, muscular atrophy, anesthesia or ulcerations are suggestive of lepra, but in other features the progress of the two diseases by no means coincides.

**Pathology.**—The pathology was first placed upon a true foundation by Danielssen and Boeck. Further investigations in all parts of the world have confirmed the correctness of their views. The lesions of the disease are produced by deposition of new material composed of small, round cells. The cells are similar in appearance to those which occur in lupus and syphilis, but are more closely aggregated and more permanent in character, and contain the specific bacillus of lepra. Dr. E. T. Wynne regards the leprosy cells as leucocytes, the protoplasm of which is enlarged to two or three times its ordinary size. If new formation of connective tissue occurs, it often becomes spindle-shaped or unipolar. Multinuclear giant cells resembling those of tuberculosis are occasionally seen. The bacilli are both extra-cellular and intra-cellular; but the so-called lepra cells are frequently, in the main, nothing but gloeal masses. The bacilli are sometimes observed to be free in the lymphatic vessels. The recognition of the bacilli is comparatively easy. They appear as fine, minute rods of about 1/5000 of an inch in length. They are usually pointed on both ends, and the majority of them contain spores. This bacillus was first demonstrated by Dr. Armauer Hansen, of Bergen, Norway, and must be recognized as the exciting cause of the disease. These organisms have been found in the skin, mucous membranes, nervous tissue, lymphatic glands, eyes, testicle, liver, spleen, and blood. In their recent work Hansen and Looft assert that they have never seen a leprous bronchial or mesenteric gland, and conclude, therefore, that the disease does not attack the lungs or intestines. Attempts to cultivate them externally to the human body have almost invariably failed, and inoculations of animals have seldom proved successful in causing general leprosy. Hansen and Néisser, however, have succeeded in producing cultures and in inoculating animals. Dr. Beaven Rake says that he failed to grow the bacillus lepræ, and that he was never able to discover in animals any local growth or general dissemination of the bacillus after inoculation. The lepra bacilli are readily stained with aniline colors, with the exception of vesuvin, or Bismarck-brown. They are easily detected by the double method of staining. Dr. Patrick Manson describes a ready procedure by which lepra bacilli may be obtained. After the blood has been expressed from a nodule, the blanched lesion is pricked with a needle, when a drop of "leper-juice" escapes. This leper-juice is treated in the same manner as sputum for the detection of tubercle bacilli, and the lepra bacillus can usually be found in great profusion. In the anesthetic form the specific bacillus is not present in the insensitive patches in the interstitial connective tissue of nerve trunks. The nerves become so completely altered that a longitudinal section presents more resemblance to tendon than to nerve. It has been found that lepra bacilli are destroyed with great difficulty; they live and multiply for a considerable period after the death of the patient. Burial, therefore, becomes a source of danger and cremation is the only scientific method of disposal of dead lepers.

The new material first appears in the corium, and gradually invades all the cutaneous and subcutaneous structures. It compresses the blood-vessels, lymphatics, and the peripheral nerves. In the later stages the papillæ are atrophied. The cells of the rete Malpighii disappear, the leprous growth approaches the horny layer, and an ulcer results. Bacilli are seldom, if ever, found primarily in the cells of the rete Malpighii. It has likewise been shown that multitudes of lepra bacilli may be present in the rete mucosum for long periods of time without exciting any local reaction. From this situation they invade the hair-follicles. The general and, as it were, accidental distribution of the bacilli upon the surface, and the tolerance of the tissues toward them, explain the absence in leprosy of an initial lesion. The leprous deposit produces trophic disturbances that manifest themselves by alterations in color, sensation, and nutrition. As the process of infiltration continues, elevations, nodules, and tubercles develop upon the surface, while the hair-follicles and glands become obliterated. The hairs fall, and the finger-nails decay.

Unna, in his latest work, defines the tubercle, or leproma, as "a diffuse granuloma, whose peculiarity consists on the one hand in its limitation to the connective-tissue elements, and especially to the lymphatic system of the skin, and on the other in the enormous growth of organisms, whose number far exceeds anything we are accustomed to find in other infectious diseases." Fatty degeneration of the cells of the newly formed tissue occurs, and ulceration and necrosis of the adjacent structures is the result. The lymphatics and blood-vessels carry the infection to the mucous membrane and internal organs. The pathological process then becomes a general one, and the same deposition and infiltration of small, round cells take place in the lungs, liver, kidneys, spleen, intestines, and testicles. Lesions of the central nervous system, including degeneration of the cord and myelitis of the posterior cornua, have also been observed. As a result of many pathological examinations Beaven Rake is able to confirm the statement of Danielssen and Boeck, that the blood of lepers contains a largely increased proportion of fibrin.

In anesthetic lepra the process of infiltration and deposition of the new cells is, in the beginning, limited to the interstitial substance between the primitive fibrillæ of the cutaneous nerves. As the process continues, the pressure upon the delicate fibres produces severe irritation, which is coincident with the stage of cutaneous hyperesthesia. More or less neuritis is then developed, the cell-growth is increased, the nerves become enormously swollen, and atrophy or fatty degeneration of a number of primitive fibres occurs. The areas, that were dependent upon the fibres for innervation, then become anesthetic. Atrophy, ulceration, and other trophic changes follow in time. After death, the ulnar, radial, median, musculocutaneous, and peroneal nerves are found to be irregularly swollen along their entire length, harder than usual, and altered in color from white to dark gray, and the neurilemma transformed into a tough, fibrous material. Bacilli are in the cells and in the connective tissue between the nerve-fibres.

Combemale and Marestang have found calcareous degeneration of the median and ulnar nerves in specimens taken from a case of anesthetic leprosy. Numerous deposits of carbonates and phosphates were found intermixed with the fibrils or occupying the lumen of empty nervous tubules.

**Etiology.**—Lepra has existed in all ages and in all countries. At the present time it is endemic in northern and eastern Africa, Madagascar, Arabia, Persia, India, China, Japan, Liberia, and the islands of the Pacific and Indian Oceans. It is also known in Brazil, Venezuela, Central America, Mexico, and the West Indies. Leprosy has been practically eradicated from western and central Europe by the most rigorous isolation; but is still active in Norway, southern Russia, and at various points along the Mediterranean. The total number of lepers in Spain was some years ago estimated by Dr. Olavide, of Madrid, at from 1,000 to 1,500.[1]

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[1] British Medical Journal, December 21, 1889.

The maximum number of lepers in the British Empire alone is given in the "Journal of the Leprosy Investigation Committee" as 500,000. From a comparison of previous censuses, however, the "British Medical Journal" (December 26, 1891) suspects that 100,000 is nearer the truth. In North America, it appears to have obtained a permanent foothold at Tracadie, in Canada, and in certain districts of Louisiana, South Carolina, and Minnesota, in the United States. Leprosy was introduced into Louisiana from New Brunswick, by the Acadians in 1758. In 1888, forty-two cases of the disease were reported in the city of New Orleans, besides those which existed in the Teche River district. Other cases of indigenous origin have been subsequently reported. Dr. Blanc makes the statement that one-fourth of the lepers in New Orleans have relatives who also are subjects of the disease. It has prevailed in Mexico ever since the time of Cortez. Pregnant lepers generally abort, though some bear healthy children. Isolated cases have also been observed in New York, Pennsylvania, Maryland, Wisconsin, and California, having been introduced into the last-named State by Chinese. It has also been brought to Salt Lake City by natives of the Hawaiian Islands. The investigations of Dr. Holmböe among the Scandinavians in our northwestern States have shown that not any of the lepers were born in this country; that most of the patients were affected before immigration, though in some cases the first manifestations have appeared after arrival. All the latter patients were adults at the date of immigration. The course of the disease is longer and milder in America than in Norway. A different climate and improved modes of life have ameliorated the disease.[1] Many theories have been advanced to account for the presence of leprosy in so many different localities and under such varying conditions of climate and modes of life. Lepra was formerly supposed to be generated by some peculiarity of the soil, or of the atmosphere, but it is found in dry as well as in moist climates, in mountainous as well as in marshy districts, and in the Arctic regions as well as in the tropical zone. The habitual consumption of improper food, such as salt fish, has also been suggested as a cause, but the disease is endemic in many localities where fish is never eaten. Mr. Jonathan Hutchinson is the earnest champion of this theory, which he has laboriously maintained in a number of publications. This author denies the contagious character of leprosy, but considers that the disease is due in all cases to the ingestion of fish, particularly if this is salted or in a state of decomposition. He consequently teaches that limitation must be sought for in improved habits of diet, and not in enforced isolation. Fish, he conceives, may be the direct means of introducing the causative bacillus within the stomach, or may excite activity in a bacillus already present in the tissues, though he considers the first to be the more probable supposition. Notwithstanding the fact that fish is one of the prohibited articles of food among certain castes in East India, he assumes that the rule is in reality secretly transgressed. This view of causation rests entirely upon hypothetical grounds. While it is true that most countries or districts in which leprosy prevails border upon the sea-coast, yet there are exceptions to this fact, as the interior of Hindostan and China. Mr. Hutchinson, under the name of fish, seems to include shell-fish "and all other living things taken out of the water." He does not limit the danger to the consumption of salt-water fish only, but regards those from rivers and lakes as equally suspicious. The theory must certainly be considered as sufficiently elastic. Inasmuch as there are few regions upon earth in which either salt or fresh-water fish are not obtainable, it is surprising that leprosy, if produced by eating fish, should not be far more wide-spread than it actually is at present. It would indeed seem that the theory admits of comparatively easy verification, or, at least, that portion of it which relates to fish being the general carriers of the lepra bacillus. If this were a demonstrated fact we should be obliged to admit that the hypothesis had been verified. It may be impossible to prove or disprove the presence in the human body of latent bacilli which are roused into development by the consumption of fish. Uncooked or improperly prepared fish may lead to depraved nutrition, or, if decomposing, may excite septic phenomena, but I find it difficult to believe that they are under any circumstances capable of giving rise to a specific infectious disease.

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[1] American Lancet, July, 1890.

Besides the inherent improbability of this theory, it is discountenanced by certain facts. Dr. Ernest F. Neve testifies that in Kashmir leprosy is quite prevalent among herdsmen, many of whom never eat fish, while the fisherman and boatmen are singularly free from the disease. Dr. Arthur Reid observed that leprosy was common in the inland Chinese province of Honan, in which fish were difficult to procure; yet the disease attacked only the very poor, who were necessarily deprived of fish on account of the expense. In Pekin, likewise, where leprosy is not uncommon, fish is said to be a costly luxury.[1] Dr. J. Kirkpatrick was for many years in charge of hospitals and dispensaries at Bangalore, in the Mysore territory. He saw leprosy not infrequently among Brahmas, who, in that part of India at least, strictly abstain from every kind of animal food. The Parsees are notorious fish-eaters, but are not especially subject to leprosy. The testimony of Prof. Cayley agrees with that of Dr. Kirkpatrick. He has witnessed the malady in a family of strict caste among whom the eating of fish was unknown. Mr. Tonkin, from a study of leprosy in the Soudan, and especially in the part known as Northern Nigeria, decided that diet is a contributing cause. The disease principally attacks persons who have a narrow vegetable diet almost devoid of nitrogen. Much the same lack of nitrogen, he declares, will be found to exist in all notably l regions at the present day. He suggests that the same deficiency existed in the diet of the poor of England in the days when leprosy was rife. Impure drinking-water, foul air, and filthy personal habits have all been regarded as influential factors in the production of leprosy, but it is obvious that they can act only as predisposing causes by lowering the tone of the general system.

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[1] British Medical Journal, March 8, 1890,

Heredity, also, has been looked upon as the essential element in the causation of the disease, and numerous cases are recorded in which lepra has occurred in the same families for generations. The phenomena of the disease, however, are in these cases never manifested at birth, rarely appearing until the children are four or five years old, and they may not develop until the fifteenth or twentieth year. Dr. Zamboaco, of Constantinople, asserts that leprosy may appear at or soon after birth. Dr. Navarro has described two cases of congenital leprosy. A woman gave birth to an ill-developed male child whose body was covered with leprous spots. In two months leprous tubercles developed upon the face, elbows, and knees. Signs of the disease soon afterward appeared in the mother and in a daughter eight years of age, who had until then been perfectly healthy. All three died of leprosy within two years. Again, a woman in the last stage of the disease was delivered of a well-formed female child, upon whom were many leprous spots and a well-developed tubercle on the upper part of the concha of the left ear. Many cases are known in which children have been born of leprous parents, but have remained free from the disease throughout their lives. On the other hand, the disease is frequently met with in persons whose ancestors were free from all leprous taint. The heredity of leprosy is a point upon which much doubt and diversity of opinion exists. The belief that the disease is handed down by inheritance was formerly well-nigh universally entertained. Of late years many positively deny this doctrine. Very few well-authenicated cases are on record in which a child was actually the subject of leprosy at birth, or developed unmistakable signs of the disease a few weeks or months subsequent to birth. It has very properly been pointed out, that although leprosy is undoubtedly a family disease, yet this fact affords an argument quite as much in favor of contagiousness as heredity. Among the members of the same family, exposed to the same conditions, living together in the same house, eating the same food at the same table, every circumstance exists which should tend to spread the disease by actual contagion or contact. Nevertheless, there are facts which point in the opposite direction. The procreative ability of lepers is seriously impaired. The wife, even if conception occur, is apt to abort. During seven years, for example, only two living children were born in the leper community at Molokai. Moreover, the rate of infant mortality is high among the offspring of lepers. This may merely indicate that the depressed vitality of the parent has been unable to furnish or to nourish a vigorous germ, and does not necessarily indicate any specific implication of the embryo. It may probably be that no more than a predisposition is inherited, a condition by which the tissues are fitted to form a ready field for the culture of the lepra bacilli. There appears, however, to be no inherent improbability, in the case of a leprous mother, of an actual passage of the bacilli, or at least, their products from the maternal to the fetal blood. I am not desirous of advocating any doctrine on purely theoretical grounds, yet I am unable to perceive that the arguments against heredity are conclusive. Dr. de Valencé believes that transmission by inheritance is the most active factor in the propagation of the disease. Apart from scientific considerations, it is extremely difficult to gather the exact personal and family histories of patients. Dr. de Valencé quotes the record of a family in which he had been able to trace descent of leprosy during almost a century. On the other hand, there is a home in Honolulu for the non-leprous children of lepers. They are kept there until 18 or 20 years of age. Dr. T. T. French[1] states that only one case was ever known to develop there, although many of the children have two leprous parents.

Some very conclusive instances of the manner in which the disease spreads are given by Dr. Heidenstam in his report on leprosy in Cyprus. The Mohammedans suffer much less than the Christians. Of sixty-one patients in the leper asylum only three were Moslems. The Turks are excessively careful in avoiding contact with lepers. The arrival of the first leper in a village is soon followed by a propagation of the disease. On the contrary, the villages which rigidly excluded such patients remained free from leprosy. Isolation has been practiced as far as possible, with the result that in ten years the number of cases upon the island has been reduced from one hundred and fifty to one hundred. Dr. Hawtrey Benson has reported[2] the case of a man who had served for many years in India where he contracted leprosy. Returning to Ireland, he slept in the same bed with his brother, a laborer, who had never left his native land, but who also in course of time developed the disease. Dr. Poupinel de Valencé, who has had an experience of twenty years in the St. Lazare Leper Asylum, of Mauritius, is convinced that leprosy is also spread by the agency of personal contact. Under favorable hygienic conditions, the contagiousness of the disease is very much reduced. Dr. Judson Daland states that at the time of his visit to Molokai no example of a case of this disease contracted in the settlement existed, despite the fact that a number of individuals living in the settlement have been exposed to the disease for periods of 15, 16 and 17 years. The non-infection of a woman who was successively married to three leprous husbands tends to prove that this disease is but feebly contagious. There is a widespread belief among the physicians in Hawaii that syphilis greatly increases the susceptibility to leprosy, and this is believed to be a part of the explanation of the Hawaiian's susceptibility to the disease. The white race enjoys a remarkable immunity and when proper hygiene and good food are secured the Hawaiian's susceptibility decreases.

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[1] Journal of the American Medical Association, Nov. 7, 1903, p. 1132.
[2] Dublin Journal of Medical Science, 1877, p. 562.

The first case of leprosy in New Brunswick occurred in 1815, in the person of a French woman whose grandparents had emigrated from the coast of Normandy, in which province leprosy has long existed. But no case was known to have developed among her ancestors. The husband and two sisters of this woman became lepers. From this origin the disease gradually spread. A lazaretto was established in 1844, but it was found impossible to maintain strict isolation. During the last twenty-five years, however, the leper asylum has been more wisely managed, and the number of cases, compared with the population, is diminishing. It is estimated that since 1815 about two hundred and thirty cases have developed. Sixty years ago, according to the inhabitants, leprosy was introduced into the Hawaiian (commonly but erroneously called the Sandwich) Islands by two Chinese coolies. This statement, however, must probably be amended, according to information published by those long familiar with the islands. Drs. Hillebrand and Saxe reported that leprosy was introduced in 1848 by Chinese, but the testimony of missionaries seems conclusive that the malady existed among the natives as early as 1823. It is stated, moreover, that very few Chinese are included among the leper population.

On the other hand, in New South Wales, leprosy was early introduced, and attacked colonists as well as Chinese. Such was the alarm and aversion of the former in reference to the malady that energetic measures were taken to prevent its spread. A leper was universally dreaded and shunned. The consequence is that at the present time all the lepers of the colony, consisting of a few Chinese and one Englishman, are strictly isolated in the Leper Hospital. Sir William Moore instances the case of a person employed to rub ointment upon dispensary patients afflicted with scabies. Among these were several lepers, and the attendant, after an injury to the hand, developed the disease, although she came of a family quite free from taint.

In 1805, there were three lepers on the island of Trinidad; in 1878 there were eight hundred and sixty. In Norway, on the contrary, where a rigid system of isolation is enforced, the number of lepers has decreased fifty per cent. within the past twenty years. Local tradition states that leprosy was brought into the island of Cyprus about three hundred years ago by pilgrims from Palestine. In the report by Dr. Heidenstam a number of striking cases are cited to exemplify the mode in which the malady gains entrance into communities and is transferred by personal contact. Very direct evidence upon this point is likewise afforded by the history of the village of Parcent, in the province of Alicante, Spain, as related by Dr. Zuriaga. In 1849 not a case existed, but in 1850 a leper from a neighboring town became domiciled with an intimate friend. The two men lived in the closest association, using the same table utensils and sleeping in the same bed. The friend became infected within a year. From this second case the disease spread to those relatives and friends who maintained any intercourse with the first victim. Since 1850, sixty cases of leprosy have occurred in this small village. From Parcent the disease spread to adjacent towns, where the first to become leprous was always some person who had frequently visited the focus of infection.

Leprosy is rapidly spreading in New Caledonia. It is estimated that five thousand out of forty thousand natives are lepers. Dr. Forné, of the French navy, states that the white inhabitants are becoming infected. He relates the history of the first white leper, who was attacked after working in a village which contained many native lepers. The man, a convict, had been transported directly from France to Noumea, and was presumably, therefore, free from either predisposing or exciting cause.[1] Dr. Navarro contributed[2] some forcible instances of the danger which lies in personal contact. The wife of a leper bore two sons, of whom one manifested signs of leprosy at the age of one month and the other at the age of two months. Two healthy servants of a woman leper became infected within a year. A healthy man married a woman who was a leper and became diseased at the end of three months.

An apparently successful attempt to inoculate the disease has been made by Dr. Edward Arning. On September 30, 1884, this physician inserted into the forearm of a condemned criminal a piece taken from a leprous tubercle. A very careful examination of the man's family and personal history was made. Four weeks after the operation the inoculated man began to experience rheumatoid pains in the left shoulder and arm. Subsequently a painful swelling of the ulnar and median nerves occurred. Bacilli lepræ were detected in the edges of the scar sixteen months after inoculation. In March, 1887, two and a half years after inoculation, the first signs of leprosy made their appearance by changes on the right ear and copper-colored spots on the right cheek. This case was welcomed as decisive evidence that the disease may be propagated by inoculation. Doubt was, however, thrown upon the subject by an article in the "Occidental Medical Times" for April, 1890, written by Dr. Sidney Bourne Swift, resident physician at Molokai. From this communication it appears that Dr. Arning was misled in supposing that the individual was free from taint. In fact, Dr. Swift has ascertained that the prisoner had been for three months in the charge of a leprous turnkey, and, furthermore, his own son and his sister's son are now the subjects of the same disease. An experiment of this character performed in a community in which leprosy is so prevalent can perhaps scarcely be conclusive. An element of doubt may always attach to such a case.

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[1] Le Progrès Médical, May 3, 1890; Medical Bulletin, July, 1890, p. 253.

[2] Lancet, June 28, 1890.

The exact manner in which the contagion of lepra is transmitted is still unknown. The discharges from the nasal chambers and from the ulcers contain lepra bacilli, which are also found on spoons, bowls and cooking utensils used by lepers. It is true, however, that many cases have been reported in which persons have maintained the most intimate relations with lepers for years and yet did not manifest any symptoms of the disease. We possess as yet but little knowledge of the modes by which the affection is transmitted from one individual to another. Lepra is not actively contagious, like small-pox or scarlet fever. Physicians and attendants in leper asylums and communities are seldom attacked. By some authorities it is asserted that no instances are known of such accidents. But this statement is nullified by the fact that in the Hawaiian Islands many of the attendants have become lepers, and that American and European inhabitants, who presumably are not brought into such close and intimate contact with diseased natives, acquire the affection. In the absence of proof that the malady is propagated by a special food, its virus must be communicated either through the respired air or, in some way, by contact. It is probable that lepra is often acquired through cohabitation. In some parts of the world it is suspected that mosquitoes serve as carriers of infection. It has been asserted that fleas may carry the contagion, but the fact has not been established by experiment thus far. Dr. W. J. Goodhue, while physician to the Molokai settlement, in 1906, discovered the *Bacillus leprae* in the female mosquito and in bed-bugs. The possibility of the communication of this disease by the bites of insects and especially by the mosquito, *Culex pungens,* seems to be fully warranted by these investigations.[1] Instances have been recorded in which lepra has been acquired from wet-nurses, or by vaccination. The accidental absorption of discharge from a leprous lesion into an abrasion would seem to fulfil the indications for the spread of the affection. Further observations are necessary to perfect our knowledge, but the evidence in our possession now is strongly in favor of the supposition that all the phenomena of the disease are produced by the inoculation and multiplication in the system of a specific micro-organism, the lepra bacillus of Hansen. From investigations in India and Egypt, G. Stricker believes that the nasal mucous membrane is usually the first locality infected, and that it is the region from which the bacillus is most frequently communicated.

**Diagnosis.**—Dr. Judson Daland[2] points out that many of the suspects present conditions rendering diagnosis extremely difficult. This is especially true in certain of the early cases complicated by disease of the skin, such as psoriasis, chloasma, scabies and erythema. Reliance is placed not only on the characteristic changes that are observed in the skin, mucous membrane and nerves, but special importance is attached to the discovery of the bacillus of lepra in discharges from the skin or mucous membrane and also in small portions of excised skin. The bacilli are discovered, usually with great ease, in the skin from the external auricle when this portion of the body is invaded. The recent observations of Boston[1] would suggest the advisability of more frequent and thorough examinations of the blood for the lepra bacillus in suspected cases.

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[1] American Medicine, Oct. 19, 1907, p. 593.

[2] Journal of the American Medical Association, Nov. 7, 1903, p. 1125.

Dr. Jonathan T. McDonald,[2] of Honolulu, summarizes the diagnostic signs of leprosy as follows:

1. The microscope is the supreme agent of the final diagnosis of leprosy. No patient should be committed to a segregated colony without a bacteriologic demonstration of the disease.
2. Of clinical symptoms, maculæ, chiefly leucodermic spots, are found in 89 per cent. of all cases.
3. The lepra nodule found in 74 per cent. is the one chief distinguishing lesion of skin leprosy.
4. Thinning or complete loss of eyebrows and lashes is present in 63 per cent.
5. Atrophic changes in hands and forearms with retraction and contraction of fingers and enlarged ulnar nerve in 32 per cent., form a leading feature of nerve leprosy.
6. The plantar ulcer found in 26 per cent., usually on the ball of the foot.
7. Absorption of phalanges in 16 per cent. with occasional spontaneous amputation.
8. Elephantiasis of hands and feet in 16 per cent.
9. Facial paralysis in 11 per cent.
10. The entire body should be carefully tested for anesthetic areas.
11. Several of the above symptoms can be found in some slight degree at least in every leprous subject.

Dr. Judson Daland concludes his interesting study of this subject with the following statements:

Certain cases of leprosy appear to be self-limited, and it is believed that this explains some of the cures that have been reported. The majority of observers believe that segregation prevents the spread of this disease. The following conclusions are deduced from this study of leprosy at Molokai and represent the prevailing opinion in Hawaii:

1. The *Bacillus lepra* is the cause of this disease.
2. This disease is feebly contagious.
3. The Hawaiian is peculiarly susceptible to leprosy.

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[1] "Lepra Bacilli in the Circulating Blood." Medical Bulletin, Feb., 1903.

[2] "A Diagnostic Examination of 150 Cases of Leprosy." Journal of the American Medical Association, June 6, 1903.

4. The Caucasian possesses a high degree of immunity.

5. Syphilis predisposes to leprosy.

6. Heredity is a factor of but little importance in the causation of this disease.

7. Segregation prevents the spread of leprosy.

8. The precise manner in which this disease is ordinarily transmitted from the sick to the well has not been proven.

9. There is no cure for leprosy.

10. Benefit may be derived from good hygiene, good food, climate, hot baths and the antiseptic treatment of ulcerative surfaces.

**Treatment.**—Lamentable as is the fact, and professionally humiliating the confession, it must be acknowledged that leprosy is at present practically an incurable disease. The safety of the community can be secured only by the isolation of every person who may become affected. Great and immediate improvement can be obtained in many cases by simple change of air and scene, but the risk of spreading the disease is so great that this measure should be recommended only in rare cases. The safety of the community must not be imperilled in order temporarily to benefit one individual; and, as Danielssen and Boeck observed years ago, "our whole theory of lepra rests incontestably upon the sad fact that within the bound where it commits its ravages it can be made harmless to the rest of the people only by isolation." This isolation should be carried beyond the point of separating lepers from the non-infected. The best results are attained by separating lepers from each other—that is, by absolute isolation. By this method lepra has been circumscribed in certain localities, especially in Norway.

The value of baths in the treatment of leprosy and especially the medicated bath, has been demonstrated by Harry T. Hollmann, of Kalaupapa, Hawaiian Islands.[1] He prefers a bath medicated with infusion of eucalyptus leaves, with a little phenol and sodium hyposulphite. The baths are given twice daily, and after each bath the patient is rubbed with the following:

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| ℞ | Ol. eucalyptus | fʒiv. |
| | Ungt. sulphuris | ʒiv. |
| | Ung. adipis lanæ | ℥ij. M. |

Temperature of baths from 105° to 110°. After several months' treatment he observed marked improvement in lesions. The itching is relieved, and this gives a good rest at night. Internal treatment consists principally in the administration of chaulmoogra or eucalyptus oil; strychnine is also resorted to.

Various remedies have been recommended as of inestimable value in its treatment, but they have been found to be of no worth as curative, and at the best only palliative. Continued observation and experimentation will doubtless ultimately furnish us with an efficient remedy, but at present the only plan from which any benefit can be derived is that which aims to improve the general condition of the patient. Iron, quinine, arsenic, and codliver oil should be administered in alternation. Mercurial preparations, apparently, are only useful in cases in mixed infection. Hallopeau and Bondet reported a case which improved under atoxyl, which has also been successfully used by Salmon. The diet should be bland and nutritious. Benefit has been obtained from the administration of large doses of creosote and salicylate of sodium. Professor Deycke, in a lecture delivered at the London School of Tropical Medicine "on a specific treatment of leprosy," states he has cultivated, if not the lepra bacillus itself, at all events an organism closely related to it; from this organism he has extracted a fatty principle, nastin, which on being injected into lepers gives rise to a reaction similar to that produced by tuberculin in tuberculosis, and which when combined with benzoyl chloride and administered in appropriate does brings about, if not in every case complete cure, at least the arrest of the disease in all but the most hopeless. According to Professor Deycke, the combination of nastin and benzoyl chloride acts directly on the lepra bacillus by depriving it of its fatty element, thereby killing it and leaving it an easy prey to the protective influences of the tissues. The microscopic specimens and lantern slides which he showed at his lecture at the London School of Tropical Medicine seemed to support his statements.[1] The bark of strychnos gaultheriana, which contains both brucine and strychnine, has been used extensively in China by native and European physicians. It is generally given three times a day, in from one to three grains (0.06 to 0.18 gm.) at a dose, and has relieved the symptoms and retarded the progress of the disease. Nux vomica and strychnia are valuable tonics, and as such may claim a place in the therapy of leprosy. I do not, however, believe that they exert any special influence upon the disease. A leper under my care was kept upon nux vomica continuously for three months, and, with a possible exception of a slight gain in the general condition, I could perceive no result. Certainly, no effect was produced upon the local lesions. Strychnine is recommended by Piffard. The Paris Correspondent of the London "Lancet," June 20, 1908, writes: "It is well known that iodide of potassium usually causes a febrile reaction and a cutaneous eruption in lepers. At the Society of Tropical Diseases on June 10, 1908, M. Marchoux and M. Bourret made a communication in which they stated that this reaction is always accompanied by the destruction of a large number of Hansen's bacilli which under the influence of the drug lose their acid-resisting qualities. They consider that this destruction of bacilli sets free a toxic product analogous to tuberculin, in the blood stream, to which the symptoms of the reaction are due. The iodide produces a variation in the leucocyte count which is modified according to the source whence the drop of blood is obtained. For instance, blood from a finger and from the neighborhood of a suppurating nodule give a similar count, whilst there is a considerable difference in the number of leucocytes found in blood taken from one of the eruptive lesions." Chaulmoogra oil has also been effective in ameliorating the symptoms and modifying the course of the disease. It can be given in doses of from five to fifteen minims, in an emulsion, in milk, or hypodermically injected, and may at the same time be used externally as an ointment, twenty to thirty grains (1.30 to 2 gm.) to the ounce. Dr. J. C. Phillippo, of Jamaica, reports decided improvement in a case after the persistent employment of gurjun and chaulmoogra oils. When the treatment was begun the patient had been afflicted for three years. For more than a year, the entire surface of the body was rubbed with gurjun oil mixed with lime-water, a bath being taken before each application. During this period the oil was administered internally. Chaulmoogra oil being then substituted, gradual improvement commenced, at first in the face. After about six years of continuous treatment the patient was considered cured and treatment was abandoned. About four years have since passed without return of the disease. Dr. A. Lutz testifies that small doses of chaulmoogra oil are without effect, but that large doses seem to promote the general health and check the progress of the malady. This writer found gynocardic acid, the active principle of the oil, to be equally effective, and more convenient as regards administration. It has also been employed in the form of magnesium or sodium gynocardate. Gynocardic acid has likewise been used as an external application, made into an ointment containing twenty grains (1.30 gm.) to the ounce (32 gm.). Dr. George H. Fox has published the case of a man in whom gradual amelioration occurred while taking chaulmoogra oil in doses gradually increased from fifteen to sixty and finally one hundred drops daily. This treatment was continued for more than two years, when, in the absence of any manifestation, it was abandoned. Four years later the patient was entirely free from blisters and spots. No trace of the disease remained except numbness and contraction of the fingers. These probably should be looked upon as results rather than manifestations. It is proper to add that a change of climate co-operated in bringing about the improvement. Unna has invented a mixed form of treatment from which brilliant results have been reported. An account of a case treated according to this method has been published by Dr. Dreckmann, of Vienenburg. The patient was a Brazilian, forty-two years of age, in whom the disease had existed for four years. The following procedure was employed: The lower part of legs and feet, as well as the forearms and hands, were covered twice a day with a ten-per-cent. pyrogallic ointment, the remainder of the body with chrysarobin ointment of the same strength. The face, except in the region of the lower jaw, was covered once a day with strong salicyl-creosote plaster-mull upon which zinc-glue was spread. A stronger application of pyrogallol was found to be soon followed by symptoms of intoxication, while a larger proportion of chrysarobin proved too irritant. The plaster-mull is said to intensify the action of the ointments. Single nodules when favorably situated were removed by the knife and the wounds healed well. During the treatment ichthyol was given internally, beginning in doses of 0.4 gramme (about six grains), gradually increasing to one gramme (fifteen and a half grains) daily, in pill. Whether the internal medication was of any service must be considered doubtful. Dr. Dreckmann states that the smaller doses were accompanied by as much improvement as the larger. Unna, however, believes that the ichthyol promotes the appetite and muscular vigor. The patient soon began to improve, the appetite and digestion were better, and within two months his weight increased twelve pounds. At the same time he gained remarkably in strength. At the close of the third month, anesthesia had disappeared. When dismissed, at the end of seven months, the man was apparently cured. In the case of feeble patients with sensitive skins Unna prefers as local remedies ichthyol in the form of a fifty- to seventy-per-cent. ointment, or resorcin ointment in the strength of ten- to twenty-per-cent.

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[1] New York Med. Journal, May 11, 1907, p. 887.

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[1] London Lancet, April 4, 1908, pp. 802-827.

A case is described by Dr. Wyndham Cottle in which chaulmoogra oil was given in doses gradually increased from twenty minims to a drachm (4 gm.). At the end of nine months the spots had faded and lost some of their thickening, anesthesia was less, the general health had improved. Ten years later the man's health was excellent, and the only evidence that leprosy had ever existed was a slight brownish staining of the skin of the backs of the hands and some loss of sensation about parts of his legs and feet. Dr. T. J. Mouat, of the Bengal Medical Service, reports[1] a case which was remarkably amended by the external and internal use of the same remedy. Large and deep ulcers of the feet healed rapidly by healthy granulations, maculæ disappeared, and the general health improved. According to Beaven Rake, the influence of this substance is uncertain and variable. Its most certain action is in allaying neuralgiform and joint pains. It is apt to excite nausea. Dr. John Murray states that the most efficacious remedy is "mudar" (*Calotropis gigantea*). The powder from the dry bark is generally employed, but he prefers the inspissated milky juice of the plant. He also gave it internally in doses of five grains (0.30 gm.) morning and evening. Acording to Dr. Lutz, the exhibition of six to eight grammes (92½ to 123½ grains) of salol daily is of service in leprous fever. Salicylate of sodium in daily quantities of six grammes (92½ grains) has the same effect, but is not as well borne. Antipyrin is useful in the neuralgiform pains; ichthyol given internally has no specific power, but allays inflammatory symptoms. Dr. Rake has seen no benefit follow the use of ichthyol or resorcin. Picrate of ammonium is useful, he declares, in the headache which accompanies the pseudomalarial attacks. Dr. Goldschmidt, of Madeira, describes in the "Bulletin Medical," a case of leprosy cured with europhen (Isobutylorthocresoliodide), the only case on record, he believes. The patient showed leprous patches on the face and limbs, which he treated with a solution of 5 grammes pure europhen to 95 grammes olive oil. This was rubbed into the leprous patches with brisk friction twice a day, ten minutes at a time, for four years. It was also applied on cotton at night, with tampons for the nostrils all the time. The leprous patches disappeared and in some places the skin healed to look normal; in others there are scars, but not a trace remains of leprosy, nor of the leprous bacillus. The cantharidine treatment proposed by Liebreich for laryngeal tuberculosis has been applied to a few cases. This plan consists in the subcutaneous injection of one to two decimilligrammes (1-640 to 1-320 grain) of cantharidate of potassium. In the cases referred to the tubercles became smaller and softer, the ulcers manifested a disposition to heal, and cicatrization occurred in some places. No pronounced effect was observed with regard to the anesthesia in general, but in certains spots sensation seemed to be improved. No alteration was perceived in the enlarged nerves. Tuberculin has been used experimentally, but only aggravates the disease. Other drugs which have given apparent good results when administered internally are phenol, in the daily dose of half to one gramme (8 to 15 grains), iodide and bromide of potassium, hydrocotyle Asiatica, hura Brasiliensis, hura crepitans, phosphorus, and antimony. Dr. H. Radcliffe Crocker has had promising results in two cases from the hypodermic injection, once a week, of one-fifth of a grain (0.012 gm.) of corrosive sublimate. In some instances the use of potassium chlorate in massive doses has been followed by improvement. Dr. J. N. Roussel, of New Orleans, reported[1] a remarkable case of cure of leprosy by potassium chlorate in one year's treatment. A method of treatment by antileprous serum has been advocated by Dr. Carrasquilla, of Bogata. This must be regarded as in the experimental stage.

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[1] Lancet, August 3, 1889, p. 233.

Dr. Isadore Dyer has made a preliminary report concerning the use of Calmette's "antivenene." This is a modified snake-venom, or serum, which is believed to confer immunity against poisonous snake-bites. With the view of ascertaining whether there is a natural antagonism between snake-venom and leprosy, Dr. Dyer employed antivenene in five cases, to the exclusion of all other remedies. The serum was injected subcutaneously or directly into the leprous lesions. In four out of the five cases marked improvement resulted. Dr. Dyer intends to continue this line of experiment.

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[1] Journal of the American Medical Association, June 13, 1903, p. 1635; see also paper by Judson Daland, previously quoted, page 733.

Dr. Albert S. Ashmead has criticized the proposed use of an antitoxic serum by inoculating apes with the leper germs, as it has been proved by experiment that the ape is unsusceptible to inoculation with the lepra bacillus. Dr. Ashmead has pursued an original method of first raising the opsonic index of the leper, and then vaccinating him repeatedly with serum drawn from his own body, from an abscess produced by the vaccinifying agent. In this manner the patient creates his own antitoxin. He has obtained improvement by this method, but does not yet claim that it is curative.[1]

The local symptoms must be treated as they arise. The cutaneous pain and hyperesthesia may be relieved by subcutaneous injections of cocaine or of morphine and atropine. Aconitine, chloroform, counter-irritation, and wet cups have also been used. The succeeding anesthesia may frequently be lessened or its development retarded by the persistent use of a mild galvanic current. Absorption of some of the tubercles may be secured, in the early stages at least, by the application of iodine, nitrate of silver, mercurial ointments, or small blisters. Brocq advises destruction of the tubercles prior to ulceration by electro-cautery. After the operation the surface is washed with a sublimate solution (1 to 1000) or a solution of phenol (1 to 20), and an ointment containing boric acid or phenol applied. Ulcers of the mucous membrane are touched with nitrate of silver in stick or solution or with tincture of iodine. Sulphur, iodine, and salt-water baths are beneficial in all stages of the disease. Nitric-acid baths have also been used, it is said, with good effect.

The tubercles and infiltrations on the tongue and in the mouth and larynx, may be rendered less painful by the application of a solution of hydrochloride of cocaine. All ulcerations should be dressed with subnitrate or subiodide of bismuth, in the hope of inducing early reparative action. If the ulcerative process manifests a disposition to spread, the bottom and edges of the ulcer should be thoroughly mopped with pure phenol, and the bismuth applied afterward. Iodoform and salol have also been used in dressing leprous ulcers. Dr. Diesing, staff surgeon, who served many years in the German army in Southern Africa, where the disease is common, used with marked success, an emulsion of iodoform in olive oil (30 per cent.). He injected daily 2 to 8 c.cm. under the skin, at first in the neighborhood of the diseased skin and, when this disappeared, in the most suitable area either the back, the breast, or the legs. The treatment began with the 2 c.cm. dose, which was gradually increased. The duration of the treatment was from 2½ to 3 months—that is to say before the complete disappearance of spots was brought about. Under this treatment, the lepra bacilli entirely disappeared from the nasal discharges.

Hillis, Dougal, and Espinet have written enthusiastically in favor of external applications of gurjun oil. The majority of the patients who employed this remedy were wonderfully benefited, and some were so much improved by its use that they were enabled to resume their former occupations.

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[1] "Training the Phagocytes to Cure Leprosy by Inoculation of Yeast Culture Cells and Dead Bacilli," Journal of Cutaneous Diseases, 1907.

The oil of cashew-nut was introduced as an external medicament in leprosy by Dr. Beauperthuy, of Cumana, in Venezuela, and has been recommended by Dr. R. H. Bakewell, late physician to the Leper Asylum of Trinidad. Cashew-nut oil is contained in the edible fruit of the *Anacardium occidentale,* natural order *Anacardiaceæ* (*Terebinthinaceæ*), of India. The nut is about the size of an almond, and has two shells, between which is found the oil, which is inflammable and exceedingly caustic. Tubercles and a portion of skin surrounding them are painted with the oil, which should then be rubbed into the skin. A little oozing follows, and in a day or two dries up into a scab. When the scab falls the tubercle is diminished in size. The oil should never be applied over the surface larger than six inches square. This writer advises the local use of nitrate of silver to anesthetic parts. Balsam of Peru, copaiba, naphthalene, and iodide-of-sulphur ointment have likewise been used with more or less success.

Nerve-stretching has been practiced for the relief of leprosy with a certain amount of at least temporary success. In thirty cases reported by Lawrie and thirty-two by Downes, it was claimed that normal sensibility was restored to anesthetic patches. Beaven Rake has published the results of one hundred operations.[1] The most notable results were obtained in those cases in which the operation was performed on account of pain, especially that associated with perforating ulcer. In two cases the suffering had been intense, but vanished almost immediately after the nerve had been stretched. In some the ulcers likewise improved, but in others they become gangrenous. The results in anesthetic leprosy were less encouraging. In a few cases light temporary gain was observed, and in some there appeared to be a certain degree of improvement of sensation a year after the operation. On the whole the results were not satisfactory. No effect upon the growth of tubercles or general infiltration of the skin could be ascribed to the operation. In two cases the separation of necrosed bone seemed to be facilitated. In one hundred cases operated on, without any particular selection, more or less relief was given in half the number. In nearly half the cases the nerve was found to be enlarged. The most commonly affected was the median, next the ulnar and external popliteal. The sciatic was never found increased in size. In a later communication[2] Dr. Rake gives his experience in the treatment of the perforating ulcer of leprosy by a method which is simpler and often efficacious. This consists in passing a bistoury through from the ulcer on the sole of the foot to the dorsum and cutting straight forward through all tissue and bringing the bistoury out between the toes. The operation, he thinks, promises well, and deserves further trial.

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[1] "The Value of Nerve-Stretching in Leprosy: Based on One Hundred Cases." British Medical Journal, December 22, 1888.

[2] British Medical Journal, November 8, 1890.

It is true that such cases as have been cited may encourage the physician to persistent and prolonged effort in the hope of at least checking the course of the malady and relieving its manifestations. It must at the same time be confessed that they do not afford very conclusive evidence as regards the efficacy of medicinal treatment. In a disease characterized by such chronicity and at the same time by such variations in the rate of progress, the improvement in Dr. Dreckmann's case, conspicuous and gratifying as it undoubtedly is, has not yet been exposed to the test of time. It may prove that, under favorable circumstances, chrysarobin and pyrogallic acid, locally applied, may cause retrocession of leprosy. This certainly is a boon to the individual patient, but it would be very hasty to conclude that his leprosy was cured, much more so to believe that the same measures would frequently have the same happy result. It is not unusual for the disease to remain stationary for a considerable period of time under any mode of treatment, or in the absence of treatment. A pertinent case is related by Dr. Castor, Medical Superintendent of the Leper Asylum of British Guiana. This observer remarks that the tendency to remain stationary is particularly characteristic of non-tubercular cases. The patient's body had been covered with patches; there was anesthesia over the limbs and parts of the trunk, with paralysis and atrophy of the muscles of both legs. No drug had been used, yet "the patches have all disappeared. Sensation is present over the body, but only partially in the hands and feet and in the lower parts of one leg; in this leg the paralysis is passing off, while the other has quite regained its normal power and function." The only remedial agents were the hygienic advantages of the asylum and good, wholesome food, including salt fish. He mentions other cases which had so improved that they might be described cured. He had used for two months the ointments recommended by Unna without result. Similar cases have been observed in Norway. One, referred to by Dr. Abraham, had remained in a state of arrest for fourteen years. Some years ago Mr. Hutchinson exhibited a woman quite free from leprosy, though twenty years previously she had been the subject of the tubercular form of the disease.

The question of immunity and immunization is an important one. Immunity may be natural or may be acquired, but the conditions of the latter are not know. Some persons are less susceptible than others and certain races more susceptible than others (leprous diathesis?), and thus susceptibility may vary at different periods.[1]

The face may be made more presentable by surgical measures, after the progress of the disease has been arrested.

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[1] American Medicine, Oct., 1907, p. 596.

PROPHYLAXIS.—All civilized nations agree as to the importance of the segregation of lepers in order to prevent the spread of the disease. Dr. Isadore Dyer,[1] of New Orleans, concludes a paper on leprosy from a sanitary standpoint, with the following suggestions:

*The Individual.*—Either the victim of leprosy should be segregated with those of like condition, or else, if he lives in his own family, he should be given a separate room; should have his meals alone; should wash his own utensils and should have his laundry boiled separately. I believe that this is difficult, because, even when the family are aware of the disease, they become careless in the family relations.

*The Public.*—The public care of lepers provides: (*a*) segregation under systematic methods which should consider (1) the segregation of the sexes; (2) some arrangement by which the trophic or nerve type should be entirely separate from the tubercle type or skin leprosy, because it is my belief that there is no reason why a leper with nerve leprosy should not acquire fresh lesions from infection by a new contagium carrying the lepra bacilli, found so freely in the tubercle type. Heretofore leprosy has been held as incurable and the simple diagnosis of leprosy has been sufficient to condemn a victim, irrespective of the type, and he is doubly condemned if he is exposed to fresh infection while he is trying to get well. (*b*) Particular methods of sanitation should obtain. No institution pretending to care for lepers should be without the fullest equipment for bathing facilities, both medical and plain. Water in leprosy is as potent in its prophylaxis as it is for remedial use.

**Prognosis.**—The prognosis of lepra is always unfavorable Temporary improvement may sometimes be obtained in isolated cases, and the disease may seem to be arrested or cured. Sooner or later, however, new symptoms develop, and the disease resumes its inexorable course. The immediate prognosis depends upon the type of the disease, the number of years it has existed, and the presence or absence of complications. Patients affected with tubercular lepra die sooner than those who are attacked by the macular and anesthetic varieties. Pneumonia, erysipelas, Bright's disease, etc., when these occur, add to the gravity of the prognosis.

According to the experience of Dr. Impey, the average duration of anesthetic leprosy is about six years, and its maximum duration about eleven years from the time that the first symptoms appear.

According to Hillis, the ultimate causes of death in leprosy, proportionally exhibited, are as follows: Bright's disease, 22.5 per cent.; pneumonia, etc., 17 per cent.; diarrhea, 10 per cent.; anemia, 5 per cent.; remittent fever, 5 per cent.; peritonitis, 2.5 per cent.; direct consequences of lepra, including exhaustion from leprous ulcerations, stenosis of larynx, leprous deposits in internal organs, marasmus, atrophy, etc., 38 per cent. Total, 100 per cent.

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[1] Journal of the American Medical Association, Nov. 7, 1903, p. 1129.

## FRAMBESIA.

SYNONYMS.—Polypapilloma tropicum—Bouton d'Amboine—Yaws—Pian—Peruvian wart.

FRAMBESIA is a contagious, infectious malady, characterized by the formation of macules, papules, tubercles, and pustules, and accompanied by more or less lassitude, fever, and pains in the joints and bones. The disease is endemic in tropical and sub-tropical countries, such as the West Indies and the western coast of Africa. It is occasionally observed in the southern portion of the United States. It has also been met with in northern Borneo and in Assam. It is chiefly observed in individuals of the African race (Hyde and Montgomery). The eruption consists at first of a number of macules, which become elevated and transformed into papules or tubercles. They are usually firm, round or oval, and red or yellow. They gradually increase in size, and become covered with small, flat, red elevations, presenting a raspberry-like appearance. Some of the lesions coalesce, forming large fungoid masses. After a time the lesions become fissured or abraded, and a semi-purulent substance oozes out. The papules may become changed into pustules.

**Symptoms.**—The eruption may appear anywhere, but is most frequently observed on the face and neck, the anal and genital regions, and the hands and feet. There is no itching or pain except when the lesions are subjected to pressure. The period of incubation is from six weeks to three months. The eruption is sometimes preceded by a prodromic period marked by constitutional symptoms, as headache, vertigo, loss of appetite, fever of a remittent type, dryness and harshness of the skin, which desquamates in spots, deep-seated pain, etc. The affection pursues a protracted course, and may, if untreated, remain for years. The average duration of each tumor is from one to three months. In severe cases it may terminate in deep and wide-spread ulceration and the formation of permanent cicatrices.

The **Diagnosis** of this disease from syphilis is in some cases attended with great difficulty. In the first place, it is, as the rule, impossible to make a positive diagnosis based on the morphology of the parasites. The only reliable method is inoculation of the spirillary lesion into the monkey; in case of yaws, the resulting lesion is a muriform papilloma, while, in syphilis, it is an induration. Clinically, the lesions of the muco-cutaneous surfaces are most likely to be mistaken for syphilis, since the yaws lesion is not always a papilloma in these regions, although on the rest of the body the typical "buttons" of yaws may be found most frequently. A very important point is the absence of yaws lesions upon mucous surfaces and the ocular conjunctiva. There are spirillar adenopathies, demonstrable upon monkeys, but these are the only extra-cutaneous manifestations. Yaws does not attack the internal organs. The lesions of the skin come out in crops, but are always the same, and are not polymorphous as the lesions of syphilis are. There is a pre-eruptive desquamation, and a marked pruritus, which distinguish yaws from syphilis. The lesions are not copper-colored nor are the bones affected as they are in syphilis.

**Pathology.**—The cutaneous tumors are granulomata, composed of round and spindle-shaped elements in a vascular network of connective tissue cells. The process begins in the papilla and the elementary node forms in the overlying rete. Dr. Harry T. Marshall[1] describes the histology of the yaws papules, as follows: The lesions are primarily degenerative changes resembling colliquative necrosis, which affects the epithelial structures. This degeneration leads to ulceration. Following the degeneration, there is an irregular new formation of epithelium in the form of down growths, and these in turn often degenerate. Accompanying these changes, vascular dilatation, edema, and leucocytic infiltration occur in the corium with a minor degree of new formation of capillaries and connective tissue. There is no endarteritis, and there are no other changes suggestive of syphilis. At an early stage of the lesion, the infiltrating cells are polymorphonuclears and mononuclears in about equal proportions with many of the later of the plasma cell type. Sometimes the plasma cells outnumber the polymorphonuclears. Eosinophile cells are abundant. The lesions from monkeys have practically the same histology as those from the human subject.

**Etiology.**—It is produced by contagion, and frequently propagated by sexual intercourse. The disease may be acquired, however, through the use of contaminated eating and drinking utensils and other infected articles. Castellani, in 1905, discovered, in the smears from yaws papules, an organism closely resembling in its morphology the treponema pallidum. This organism he named *Spirocheta pertenuum;* but subsequently this was changed to *Treponema pertenuum.* Wellman has confirmed this observation in Angola, and Ashburton and Craig have found in the Philippines that the organism was constantly present in the lesions of yaws, as observed in certain districts on the islands of Luzon and Mindanao. They succeeded in inoculating monkeys with it and assert that there is a difference between this treponema and the *Treponema pallidum.* George Edward Punez[2] of Antigua, has pointed out the clinical features which distinguish yaws from syphilis.

**Treatment.**—The most effective treatment of frambesia consists in the administration of chalybeate tonics and the mineral acids. Iodide of potassium, iodoform, sulphur, sulphide of calcium, and guaiac have been used with benefit. Scrupulous attention must be paid to cleanliness. The lesions should be washed with soap and water twice a day and then dusted over with calomel or weak nitric acid, or phenol lotions may be applied. In some cases a weak mercurial or sulphur ointment may be employed with advantage. Iodol and thymol iodide may also be used as dressings. Spontaneous cure may occur in the absence of treatment.

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[1] Philippine Journal of Science, Oct., 1907.

[2] Transactions of the First Pan-American Congress, vol. ii.

The **Prognosis** is favorable except in young children and in debilitated or cachectic adults. The malady occasionally ends fatally in consequence of hemorrhages and exhaustion.

## VERRUGA PERUANA.

SYNONYMS.—Oroya fever—Carrion's disease.

Peruvian wart is a peculiar infectious disease, transmissible by inoculation, occurring endemically in the valleys of the Andes in Peru, and exceptionally elsewhere.

**Symptoms.**—The patient, usually a resident of a malarial region from 3,000 to 10,000 feet above the sea level, first suffers with muscular and joint pains and fever, possibly for several months, the fever being irregular and attended by progressing anemia, and enlargement of the liver and spleen. Great prostration may occur, resembling congestive chills. Death may occur before the appearance of the characteristic skin lesions. These appear first as macules of a pink or reddish color, subsequently becoming darker. From these lesions, warty growths develop, which may become as large as a pigeon's egg. They are prominent, soft, smooth, and shining. Vesicles, pustules, or blisters, may also develop. The most prominent portion of the soft growth frequently thins and becomes cracked, and fungous excrescences form. Ulceration may occur, and free hemorrhages may result, or more commonly a thin ill-smelling discharge, which tends to form crusts. These changes may occur in a few days, or the disease may continue for months. In favorable cases, the lesions gradually dry up, shrivel and scale. This may be attended by serious pruritus. Various complications may occur to bring the case to a fatal conclusion, such as internal hemorrhages, meningitis or convulsions. Profound anemia is one of the common symptoms of the disease.

**Etiology.**—The disease is called Oroya fever, because it has prevailed most frequently and extensively along the line of the Oroya railroad. It is due to an infection. Dr. Carrion, after whom it is named, perished after inoculating himself with the blood from a patient. It is believed that the drinking water is the principal agent in communicating this disease. Senn remarked: "That the parasite of the disease exists in the water-supply, is more than probable, because the disease is disseminated along certain water courses which pass through the deep mountain cuts on the west side of the Andean water-shed." Tschudi said that the disease may be contracted by drinking a single glass of water taken from these contaminated streams, while those who only pass through these valleys can do so without danger. Odriozola believes that the poison exists most frequently in the water, but that it also lives in the atmosphere and soil, as persons have contracted the disease who abstained from drinking the infected water. "Certain diseases, like syphilis and tuberculosis, increase the liability to the disease and increase its malignancy."[1]

The **Treatment** of the disease is principally symptomatic. The fever is relieved by ice-water applications to the head, and by quinine and salicylic acid internally. Phenol and other antiseptic agents have been employed in this disease; but without decided effect. Fowler's solution of arsenic and chalybeates have been found useful in combating the marked anemia.

**Prognosis.**—In acute cases the disease often proves fatal in from 25 to 30 days. In the milder or chronic form, accompanied by irregularities of temperature, it may continue for a very long time. In favorable cases, the nodules disappear by absorption, leaving a local staining of the skin, for a time, causing a mottled appearance.

## PELLAGRA.

SYNONYMS.—Lepra Italica—Lombardy erysipelas or leprosy—La rosa, etc.

PELLAGRA is a chronic inflammatory, endemic, constitutional affection, characterized by severe gastro-intestinal and nervous disturbances, and accompanied by cutaneous symptoms. Any portion of the skin may be involved, but the face, neck, arms, shoulders, and legs (all of which, among certain classes in the countries where it is prevalent, are habitually unprotected from the sun) suffer most severely.

**Symptoms.**—The epidermis becomes reddened and painful, and may peel off in large patches. Vesicles and bullæ may also form. The eruption is always aggravated during the summer. It may appear at any age and in either sex. The constitutional symptoms are varied and severe. Ptyalism, fetid perspiration, hypertrophy of the nails, convulsions, paralysis, and hallucinations frequently occur in the course of the disease. Pellagra is endemic in Italy, and is occasionally observed in southern France and Spain. A number of causes are concerned in its production, as imperfect ventilation, impure water, and insufficient food. The most important factor is the use of diseased maize as food. Lesions of the spinal cord have been demonstrated by E. Belmondo and S. Mircoli. In the more acute forms the lesions assumed the character of an acute general myelitis, while in the chronic cases degeneration was found, especially in the lower dorsal region. Parhon and Goldstein, of Bucharest,[2] have reported an interesting case of pellagra in which sialorrhea was a prominent symptom, which was evidently of nervous origin.

At a meeting of the Academy of Medicine, M. Marie said that an examination of insane Arabs suffering from pellagra in the Abasseeh Asylum showed that genuine pellagra was almost constant among them just as among the population from which they were derived; they were therefore pellagrous persons who had become insane. Some mental disorders following pellagra owed their origin to it, and on that account presented typical psychological characteristics associated with the physical symptoms of pellagra. Certain paralytic forms of insanity occurred in pellagrous individuals and confirmed the opinion of Baillarger who maintained that pellagrous paralysis might assume a form clinically and pathologically indentical with general paralysis of the insane. The diseases were, however, not the same and M. Marie considered that general paralysis of the insane was a syphilitic manifestation. The two forms might be combined—that is to say, cases were known in which Arabs suffering from general paralysis were both syphilitic and pellagrous.

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[1] Journal of the American Medical Association, Jan. 25, 1908, p. 275.

[2] Le Progrès Médical, Oct. 10, 1903.

**Etiology.**—Lombroso claims it is an intoxication due to an extractive substance similar to ergotin formed by the growth of certain fungi on corn. He has obtained watery and alcoholic extracts of damaged corn and has produced experimentally symptoms similar to those of pellagra. He calls this extractive substance pellagrazein.

An epidemic of pellagra, in this country, has been reported by Dr. Geo. H. Searcy. It occurred among the patients of the Mt. Vernon Insane Hospital in Alabama, who were fed principally upon maize. Of 88 cases, only 8 were male. The average age was 34 years. The location varied: of skin lesions, 85 per cent. showed it on backs of hands and wrists, 35 per cent. had it on dorsal surface of feet, and the same proportion on the back of the neck; 20 per cent. had it on the face, *i. e.* about the cheeks; only 8 per cent. had the lesions on all of these locations; 72 per cent. had no skin lesion at all, just the salivation, gastro-intestinal disturbances and nervous symptoms. No nurses had the disease. They associated constantly with the patients and handled them. The chief difference was in the diet, as they only ate little maize and had more variety. Prognosis was unfavorable. Death occurred in two or three weeks, or longer. Recovery exceptional and very slow.

A sample of the meal used at the Mount Vernon Hospital was sent by Dr. Searcy to the pathologist in charge of the laboratory of plant pathology at Washington, and he reported the meal wholly unfit for human use; that it was made of moldy grain and contained quantities of bacteria and fungi of various sorts, some of which were identified.

In addition to the eating of damaged corn, the sun has been supposed to have much to do with the cause of pellagra, as the cutaneous lesions appear in those places exposed to the sun's rays, as back of hands, back of feet, face and neck. It is now generally accepted, however, that the chemical rays simply have more or less influence on the severity of the skin lesions and do not cause them. Gerardini, and later Hameau, obtained differently-shaped patches of erythema in cases of pellagra by means of gloves fenestrated in various ways.

One case in the epidemic at Mount Vernon, in which the patient wore a band around his wrist, showed a severe erythema above and below the band, but beneath it the skin was but slightly affected. In some cases there is no doubt that the sun makes the skin lesions more severe, but severe skin lesions do occur in those who wear shoes and are exposed to the sun but little.

Neusser pointed out that the erythema affects only the hands and feet of gypsy children in Roumania, although they go about perfectly naked, and it is also known that the disease abates in the fall as cooler weather comes on.

It is generally accepted now, however, that pellagra is caused by eating a substance formed by the growth of certain organisms in corn. This substance attacks the central nervous system, affecting trophic centers, and the chemical rays of the sun influence, more or less, the severity of the lesions in those regions whose trophic centers are affected and which are exposed to the sun.

Podelcoma.—The disease which is known as podelcoma, fungus-foot, Madura-foot, or mycetoma, finds appropriate mention here. It usually involves the sole, but may manifest itself on any portion of the body. Podelcoma usually occurs in people who go barefooted and work in the fields. The disease generally attacks the great toe first, and in most cases has been traced to some injury. It is not attended by marked constitutional symptoms, and, as far as is known, never affects the internal organs. It is characterized by a reddened, swollen, and painful condition of the affected part, followed by ulceration and formation of deep sinuses, surrounded by soft, fungiform, tubercular masses of varying shapes and sizes. The disease is not infrequently met with in India, where it has been described by Vandyke Carter, Lewis, and Cunningham. In a case occurring in this country, reported by Kemper, the patient was a young man whose foot became reddened, swollen, and painful without any apparent cause. After a few weeks several bullæ developed on the affected surface and ruptured spontaneously, exposing several small orifices from which a whitish, glairy substance exuded. Ulceration then ensued, resulting in the formation of deep-burrowing sinuses. The pain was so intense that amputation of the foot had to be resorted to in order to procure relief. The muscles of the dismembered foot were found to be partially disintegrated and to contain masses of a mould-like substance, which on microscopical examination was seen to consist of irregular, granulated, refractive bodies resembling vegetable spores. A similar but milder case, occurring in the practice of the late Dr. Charles T. Parkes, is described by Hyde. The patient had resided in India for many years. The characteristic tubercular lesions appeared around the inner malleolus of the right ankle, after which, in spite of all the treatment at first resorted to, an ulcer formed and steadily increased in size for five years. Deep sinuses penetrated the tissues in all directions, and the entire surface became covered by a soft, white, fluffy, mould-like substance. Dr. Parkes finally scraped the ulcerated tissues thoroughly, and applied to them a dressing of saturated boric acid, after which repair ensued.

The cause of this disease is not known. The theory that it is due to a vegetable fungus appears plausible. Prof. R. W. Boyce and Dr. N. F. Surveyor have described a streptothrix which they have obtained and cultivated. The fungus is a vegetable parasite and, if not identical with the ray-fungus, is closely related to this organism, and as stated by Hyde and Montgomery, it belongs to the same family, although the precise class has not been determined. It enters the foot through a traumatism, and is rarely found among persons who have their feet constantly protected by shoes. It does not appear in infants or young children.

Musgrave and Clegg[1] have described in a case of Madura-foot, a new form of micro-organism, which they have named the streptothrix Freeri, after Dr. Paul Freer, Director of the Bureau of Science of Manila. This parasite is said to present some morphological and cultural differences from streptococcus Maduræ of Vincent, and also Fullerton's streptothrix. The disease is distinct from actinomycosis. It appears that the Madura-foot of the Philippines may be due to an organism, which differs, in some respects, from that causing the Madura-foot of India.[2]

Perforating Ulcer of the Foot.—The affection known as perforating ulcer of the foot, or *mal perforant du pied,* may here be briefly described. According to Monod, who has written with precision on the subject, it is met with almost exclusively on those spots of the sole of the foot that are subject to the greatest relative pressure from the boot or shoe—the heel, the ball of the great toe, and the distal extremity of the fifth metatarsal bone. The progress of the disease may be divided into three stages, the first consisting of an excessive thickening and hardening of the epidermis, with a callosity at one of the points of greatest pressure. This stage may last for years, and may be the only evidence of the disease. The second stage is that of ulceration, which may occur either as the consequence of atrophy of the corium, from long-continued pressure, or as the result of the inflammation and suppuration of the synovial bursa. The ulcer varies in character, but usually appears as if it had been punched out of the centre of a mass of thickened epidermis. It is indolent, and accompanied, even upon pressure, by little or no pain. The surrounding skin is cold, and less sensitive than the normal surface. In the third or perforative stage of the disease the ulcer penetrates deeply through the tissues, destroying in succession muscles, tendons, periosteum, and finally the bone.

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[1] Philippine Journal of Science, Dec., 1907.

[2] Editorial, New York Med. Journal, May 3, 1908.

This disease occurs as a general rule in men who are obliged to stand or walk a great deal. One or more ulcers may be present, and both feet may be involved at the same time. According to Treves, the ulceration is a purely local process, produced only by local causes. Duplay, Morat, and many others, however, believe it to be the result of morbid alterations occurring either in the brain, the spinal cord, or the peripheral nerves. In twelve cases reported by Ball and Thibierge to the eighth International Medical Congress, the ulceration was coincident with the development of locomotor ataxia. It is probable, however, that both nervous degeneration and local pressure, or injury, are necessary factors in its production. Neurotic phenomena are usually associated with perforating ulcer, and enable it to be differentiated from *Madura-foot, tuberculosis,* or simple *callosity.*

The most effectual treatment consists in placing the part completely at rest. The callosities should be pared off with a sharp knife, and the ulcer should be covered with subnitrate or subiodide of bismuth, in order to induce prompt reparative action. If a sinus has formed, it should be either opened or thoroughly cauterized. If the soft parts have been destroyed, or the bone injured, resection or amputation may be necessary. The disease may, however, recur in the stump.

## EPITHELIOMA.

SYNONYMS.—Cancroid—Carcinoma epitheliale—Rodent ulcer—Epithelial cancer.

Epithelioma, sometimes called "rodent ulcer," is a superficial, semi-malignant form of carcinoma, primarily involving the skin and the mucous membrane lining of the various orifices of the body.

**Symptoms.**—There are three well-marked varieties of epithelioma—the superficial, the deep-seated, and the papillary.

The superficial variety usually manifests itself by the development in the upper layers of the skin of one or more small, firm papules or nodules. The lesions are pale-red or yellowish-white in color, and present a glistening, waxy, or a semi-transparent appearance. They vary in size from that of a pin-head to that of a small shot, and are generally grouped, forming a wart-like projection above the surrounding surface. They soon become slightly fissured, and exude a scanty tenacious, opaque secretion, which dries up and forms a thin, brownish crust. The disease might be mistaken at this stage for a simple abrasion of the surface, or for an ordinary wart that had been irritated by scratching. The papule or nodule manifests no disposition to heal, however, but slowly enlarges peripherally by added nodules. The nodules are commonly known as cancroid corpuscles, and are characteristic of this affection. They can readily be picked or squeezed out of the skin, and when rubbed between the fingers crumble into small particles, which, when examined microscopically, are found to consist of epithelial cells of various shapes and sizes.

Sooner or later new points of excoriation appear, and finally the whole mass breaks down and becomes converted into a superficial ulcer. The ulcer thus formed is usually round or oval, with sloping, indurated, and slightly elevated edges. Its base is reddish and granular, and is covered with a viscid, yellowish secretion. The ulcer bleeds easily, although not at first painful, and slowly increases in width, until in some cases it attains a diameter of an inch or more. It may then remain for years as a purely local lesion. Sooner or later, however, the ulcer extends in depth as well as in breadth, and manifests its malignancy by attacking the deeper tissues. This disease, which was long known as rodent ulcer, is simply a variety of the superficial form of epithelioma, and occurs most frequently upon the nose, cheeks, eyelids, and forehead. It presents itself as an irregular, superficial, sharply circumscribed ulceration, with infiltrated, perpendicular sides. Its surface is dark red and uneven, and covered with a scanty brown or yellow secretion. The author reported[1] an interesting case of this variety involving the head and face, with great destruction of tissue. The progress of the ulceration is slower than the other forms of epithelioma, but it is ultimately far more destructive, as it invades every tissue, whether muscular or osseous, with which it comes in contact.

The deep-seated or infiltrating form of epithelioma may, like the superficial variety, arise from the degeneration of an ordinary wart or a sebaceous tumor. It generally begins with the formation of one or more large, round nodules in the subcutaneous connective tissue. The lesions vary in size from that of a small shot to that of a bean, and are light red or purplish in color. They are surrounded by an inflammatory or congestive areola, and are slightly elevated above the surrounding skin. The nodules are firm to the touch, and at first not painful. They slowly increase in size and number, and gradually coalesce to form large, irregular tumors or masses of infiltration. Sooner or later, however, ulceration begins either on the surface or in the centre, and rapidly spreads until the disintegration of the growth is complete. The ulcer thus formed is irregular in shape and size. Its sides are steep and everted, and the base is covered with a thick, yellowish secretion. It is surrounded by a zone of infiltration, and bleeds easily when touched. The ulcer rapidly increases in width and depth, and becomes the seat of sharp, lancinating pain. The neighboring lymphatic glands become hard and swollen, other structures are soon involved, and the patient finally dies from pain and exhaustion.

The papillary variety generally begins as a wart-like formation elevated above the adjacent cutaneous surface, and varies in size from that of a split pea to that of a chestnut. In some rare cases it appears as a large lobular or spongy excrescence developed during the ulcerative stage of one of the preceding varieties of the disease. It slowly increases in size, but after a time becomes fissured and covered with large, exuberant granulations from which a thin, sanious, offensive secretion issues. The surface may remain moist or may become covered with masses of crusts and scales, but finally breaks down into an irregular, open, and painful ulcer. The further course of this variety depends upon the depth to which the tissues were penetrated by the primary lesion. In some cases the papilloma having been situated superficially, the resulting ulcer also remains superficial for a long time. In the majority of cases, however, it is imbedded in the subcutaneous connective tissue, the ulcerative and infiltrative processes extend widely and deeply, and the disease pursues a malignant course.

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[1] "Epithelioma, Involving the Head and Face With Great Destruction of Tissue." London Medical Press, May 8, 1907.

A distinct clinical variety of epithelioma is described by Sir Jonathan Hutchinson under the name of "crateriform ulcer." He has seen it upon the face only, and in persons past the middle period of life or of advanced age. It is peculiar in rapidity of growth and in form. This acute epithelial cancer of the face develops in the course of a few months as a bossy mass, shaped like a bee-hive and considerably ulcerated. Softening in the centre gives rise to a crateriform depression. There is little or no tendency to recurrence after removal or to glandular involvement. Hutchinson suspects that the singularity of their development is due to their origin in moles instead of formerly healthy skin.

Epithelioma is a disease of middle and advanced life. It is rarely observed before the fortieth, and is developed most frequently between the fiftieth and sixtieth years. It occurs more often in men than in women. The disease may appear upon any portion of the body, but it is most frequently met with on the face and in the genital regions. The eyelids, the cheeks, and the upper lip are favorite localities for the superficial variety of the disease. Dr. Eschweiler[1] has critically studied the histories of his own and collected cases of cancer of the lip, amounting to sixty-six in number. According to this investigation the disease is much less common upon the upper than the lower lip (one of the former to seventeen of the latter). It occurs more frequently upon the left than the right side, and more often among working people than the leisure classes.[2] The deep-seated variety manifests a special predilection for the forehead, the nose, and the lower lip. An interesting analytical study has been made by W. R. Williams of epithelioma of the lip based upon the records of one hundred cases.[3] Of more than fifteen thousand new growths consecutively under treatment in several London hospitals during the preceding sixteen to twenty-one years, three hundred and fifty-two, or twenty-two per cent., originated in the lip. All of these growths except twenty were epitheliomata. In three hundred and twenty-nine cases the disease began in the lower lip, and only in three cases in the upper lip. The mucous membrane lining the nasal and buccal cavities often becomes involved either primarily or secondarily, and the tongue also may become the seat of the disease. The penis may be attacked by either the superficial or the papillary variety. The superficial variety is occasionally observed upon the scrotum, where it forms the disease long known as chimney-sweeper's cancer. The conjunctiva, pharynx, larynx, nipple, labia, vagina and uterus may be attacked by any variety of epithelioma. The anus and rectum also are subject to the disease. Epithelioma has sometimes been observed upon the abdomen, the backs of the hands, and upon the scalp. It occasionally happens that several growths simultaneously develop. Most of these cases follow continued or extensive local irritation. In three patients, Dr. C. Schimmelbusch has observed the occurrence of multiple primary growths in the skin.

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[1] Deutsche Zeitschrift für Chirurgie, vol. xxix.

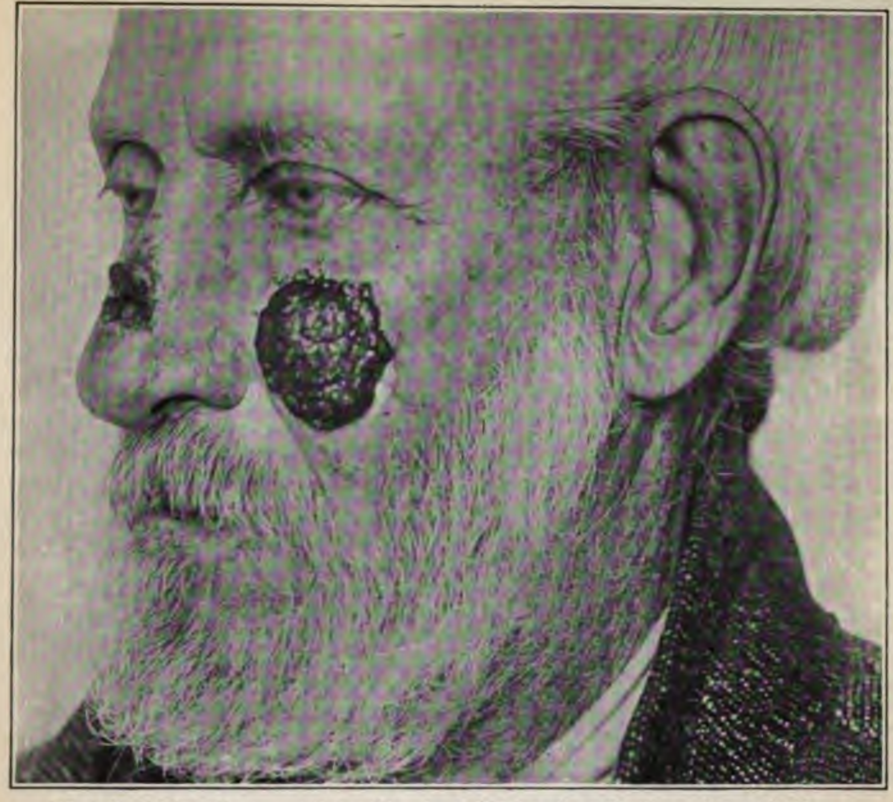
[2] Medical Bulletin, December, 1890.

[3] Medical Press, May 1, 1889.

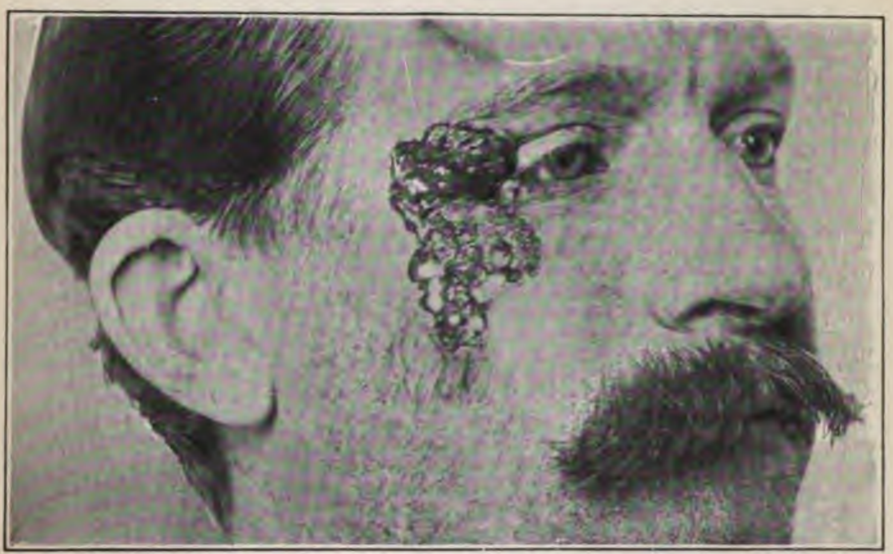
**Diagnosis.**—The diagnosis of epithelioma is easy in the advanced stages, but it might in the beginning of an attack be confounded with the lesions of syphilis and lupus vulgaris, or with ordinary warts, simple condylomata, or seborrhea sicca. The papule or nodule of epithelioma may at first resemble a *hard chancre,* but the history of the case and the course and duration of the lesion will soon point to the correct diagnosis. The epitheliomatous ulcer might at first sight be confounded with a tertiary *syphilitic ulcer,* but the latter are usually multiple, while epithelioma is almost invariably single. The secretion in syphilis is fetid, yellow, and abundant, while in epithelioma it is, as a rule, blood-streaked, viscid, and scanty. Epithelioma is generally surrounded by a well-marked zone of infiltration, which is either absent or insignificant in syphilis. Finally, epithelioma is a disease of long duration, accompanied by severe, lancinating pain, while the ulceration of syphilis runs a comparatively swift course and is not attended with any pain.

The papillary form of epithelioma usually attacks the genital regions, and may be confounded with ordinary *condylomata.* The presence or absence of pain and the age and history of the patient will assist in enabling the physician to make a correct diagnosis. If more than one lesion be present, the presumption is in favor of condylomata. In doubtful cases the growth should be removed at once, as serious results may be produced by delay.

Epithelioma sometimes presents a superficial resemblance to *lupus vulgaris,* but the former rarely manifests itself before middle or advanced age, while the latter usually begins during childhood or early youth. The lesions of epithelioma are mostly single, and limited in area, while those of lupus are multiple and widespread, and may appear on several regions of the body at the same time. The patches of lupus are generally surrounded by the characteristic papules and nodules of that disease, while epithelioma is encircled by a zone of infiltration. The secretion from the ulcer of lupus is abundant, yellow, and puriform, while that from epithelio-



Nodular Epitheliomata of the Cheek and Nose in a Patient, Age 74 Years.
(See page 754)



Ulcerative Epithelioma of the Face in a Male 38 Years of Age.
(See page 755)

ma is scanty, viscid, and often very offensive. Finally, pain is a marked feature of epithelioma, while lupus is attended with little or no pain.

It is often difficult, and even impossible at times, to decide whether a new wart-like formation is the initial lesion of epithelioma, or only an ordinary *wart*. The difficulty is increased by the fact that an apparently simple wart may after the lapse of many years become the seat of some degenerative process, and become converted into epithelioma. As a general rule all such formations developed after the age of thirty should be looked upon with suspicion and removed at once, especially if they make their appearance on the lips or nose, or near any of the orifices of the body.

Epithelioma of the face, especially in elderly persons, is sometimes preceded by a congestive, scaly condition of the surface, resembling that which occurs in *seborrhea sicca*. The latter disease, however, usually occurs over a wide-spread area, or on several portions of the body at the same time. The lesions of epithelioma are, as has been said, usually single, and limited in area, and accompanied sooner or later by characteristic small, waxy nodules, the so-called "cancroid corpuscles."

**Pathology.**—Epithelioma consists essentially of the inward growth and continuous multiplication of the epithelial cells of the rete mucosum. If, at the commencement of the disease, a vertical section of the skin be made, the only variation from the normal condition that can be observed is the unusual length of the interpapillary processes of the rete mucosum, which project down into the corium like the fingers of a glove. Other and more inportant changes soon follow: the blood-vessels become dilated, the deeper layers of the skin become infiltrated with serum, and the lymph-spaces crowded with wandering cells and lymphoid corpuscles. The projecting, finger-like processes of the rete increase in size and divide into branches, which unite with each other to form a framework of epithelial tissue. The cells of which they are composed become pressed together and form compact masses of various shapes and sizes. Sometimes they are arranged concentrically, like the layers of an onion, forming the so-called "epithelial nests" or "epithelial globes." At other times they are arranged in cylindrical, conical, or club-shaped masses. In some cases the central cells undergo complete horny transformation. In papillary epithelioma there appears to be a combination of papillary hypertrophy and epithelial proliferation. Finally, in all cases, the gradually increasing pressure of the epithelial cells interferes with the circulation. The small papillæ and their arteries become obliterated and the larger vessels are lessened in calibre. Degeneration and ulceration soon appear and mark the beginning of the second stage of the disease. As long as the ulceration remains superficial the patient's health is not much affected; but when it extends to the deeper tissues, the neighboring lymphatics soon become affected, and through them the general system becomes profoundly involved. The composition of the blood is altered, and degenerative changes with the production of toxic products occur in various tissues. The alkalinity of the blood is decreased, and the destruction of albumin is increased irrespective of the nature and amount of food consumed. There is consequently an excessive formation of urea, which, nevertheless, is imperfectly eliminated. Muscular tissue and parenchymatous organs undergo fatty degeneration. G. Lenthal Cheatle[1] has found inflammatory changes in the spinal-root ganglia in cases of cutaneous cancer, and in the Gasserian ganglion in a patient dying with rodent ulcer of the face. He observes that areas of occupation of cancer in the skin correspond to cutaneous nerve areas in a very suggestive manner; and in their distribution resembles that of the spread of morphea, leucoderma, nevi, herpes zoster of the head and face, and some cases of moles. Death may occur from pain and exhaustion, or from the transference of the disease to one of the internal organs. The fatal termination is not infrequently preceded by coma, the result of the accumulation in the blood of toxic, excrementitious principles. The excretion of urea almost entirely ceases, and in two cases of cancer-coma Klemperer has discovered oxybutyric acid in the urine. This substance likewise represents disintegration of tissue.

**Etiology.**—The etiology of epithelioma is unknown, but evidence at hand suggests that it is of parasitic origin, and that, under certain conditions, it may be contagious or communicable. In some, the disease seems to result from long-continued pressure, or other mechanical irritation. In a reported case of epithelioma of the abdomen, the disease was evidently induced by the pressure of a board which the patient kept constantly suspended against his abdomen while working at his trade of shoemaking. Chimney-sweeper's cancer is supposed to originate from the irritation produced by the soot collected in the folds of the scrotum; and epithelioma of the lips and tongue is often apparently due to the irritation of a short pipe or a broken tooth. In the series of cases investigated by Mr. Williams, a history of previous disease or injury of the lip was given in thirty-five per cent. of the entire number. Contact with paraffin occasionally originates epithelioma, as noticed by Dr. Joseph Bell, and described by Schuchardt.[2] Old scars, pre-existing warts, nevi and sebaceous cysts frequently undergo degeneration without any apparent cause, and become the seat of epithelioma. Cases often occur in which no source of irritation or of traumatism can be discovered. A predisposition to the malady seems to exist in some families. A family history of cancer was present in 5.7 per cent. of the cases analyzed by Mr. Williams. Epithelioma is more common in the male sex than the female. Old age is, however, the most important predisposing factor and it is probable that one directly exciting factor consists in some undiscovered change in the trophic nervous system.

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[1] British Medical Journal, July 20, 1907, p. 140.

[2] "Beiträge zur Entstehung der Carcinoma," in Volkmann's klinischer Vorträge, No. 257.

The view has been advanced that carcinoma in all its varieties is of parasitic origin. If this theory were demonstrated it would furnish a rational explanation of those cases which are met with from time to time, and which excite the suspicion that cancer may be transmitted from one individual to another. Examples are the development of cancer of the penis and testicle in the husband of a woman who was the subject of malignant disease of the neck of the womb. Also the case of a servant girl who washed the linen of her mistress suffering from cancer, and who, six months after the lady's death, entered a hospital with cancer of the axilla. A similar example is afforded by the history of a small commune in Normandy in which during eight years fifteen per cent. of the total mortality was due to cancer. At the Cancer Congress held lately in Budapest, Dr. Kaczvinsky read a paper[1] on the "Communicability of Cancer." He is of the opinion that cancer is a communicable disease. The reasons for this are, first, its great increase in modern times; the fact that cancer is most frequent where the population is the densest—that, for instance, it is more common in direct ratio to the density of the population in the poorer districts in Budapest than any other; that it seems to follow certain watercourses; that it becomes connected with houses; and that so many cases that are seen by surgeons can be readily traced to possibilities of communication. For instance, it is not unusual to find cancer occurring in those who are closely associated with one another. Dr. Kaczvinsky has recently seen a cancer of the tongue in a workman who had been with another workman suffering from the same disease. Some observers have seen it in two brothers who were living in intimate association, in a brother and sister where one had nursed the other, and in a wife and husband who had been very much together.

Epithelioma may also extend to an adjacent opposing surface, as in a case reported by Hamburger, where an epithelioma of the left labium minus gave rise to a tumor of the same nature upon the corresponding right labium.

Ravogli, of Cincinnati,[2] reported a case in which a man had nodular carcinoma of the back of the forearm. He was an engineer, who had rodent ulcer of the nose, and who had frequently rubbed his arm against his nose to relieve itching.

The natural history of carcinoma renders probable the belief that it is of infectious character. It begins with a single local lesion, from which the disease spreads to lymphatic glands, and subsequently to distant tissues or organs. The chemical composition of the blood is changed, degeneration of tissue takes place, and finally fatal toxemia occurs. Attempts to propagate cancer by inoculation have often been made from the time of Alibert, and generally without success. No authenticated case is yet on record in which it has been transferred from man to one of the lower animals. Experiments, however, have demonstrated that cancer may at least be transmitted by inoculation from one animal to another of the same species. A rat having died of a spontaneously developed carcinoma, Hanau introduced small pieces, taken from uninfected glands, into the peritoneal cavity of two rats. Both animals were found to have developed the disease at the end of fourteen weeks. This author suggests, moreover, that age may be a factor in such investigations. Carcinoma is a disease of old age. Probably the chances of success would be better in operating upon old than upon young animals. Wehr asserts that in experiments upon twenty-six dogs he obtained in one case a positive result. Again, as regards a parasitic origin of cancer, I have already described the relationship which exists between Paget's disease of the nipple and cancer of the mammary gland. Beginning as a chronic inflammation of the skin, its glands and their ducts, so-called eczema of the nipple, is almost invariably transformed into carcinoma. But the same organisms which Darier detected in cutaneous psorospermosis had been studied by Albarran in sections from a cancer of the jaw, and identified by Malassez and Balbiani. Cornil has seen psorosperms in cancer of the womb, Thomas in mammary cancer not dependent upon Paget's disease, and Wickham in epithelioma of the nose. Albarran has also described a vesical psorospermosis in which the epithelium of the bladder proliferates, the connective tissue of the organ is invaded, and the mucous membrane elevated in the form of papillary excrescences. In the epithelial cylinders were found psorosperms. The same author has likewise discovered protozoa of similar character in two cases of epithelioma of the bladder.

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[1] Lancet, July 10, 1907.

[2] Cincinnati Lancet Clinic, Jan. 9, 1904, p. 39.

A later publication upon this subject is by Dr. William Russell, of Edinburgh, who has observed a characteristic organism, or what he considers to be such, in carcinoma. Peculiar bodies were brought into view by double staining with Grüber's iodine-green solution and fuchsin, the green replacing the fuchsin in every part of the section except in certain spherical forms to which he gave the title of "fuchsin bodies." These may be present at the margin of the growth, or among and in the epithelial cells of the alveoli. The bodies generally occur in groups, and are nearly always surrounded by a clear space. Fuchsin bodies are perfectly round, but vary considerably in size. The clear space or vacuole is not dissimilar in appearance to a capsule, and the bodies might be looked upon as encysted psorosperms were it not for the features of their development. This process is by globular buds protruded from the parent body, from which they gradually increase their distance, and to which they remain attached by a delicate filament. From their mode of multiplication Dr. Russell believes that the fuchsin bodies belong to the sprouting fungi.

These researches are interesting, important, and suggestive, though scarcely conclusive. Both Darier and Lustgarten admit that little is known regarding the mode of propagation of psorosperms. As regards the fuchsin bodies of Dr. Russell, very similar if not identical bodies have been seen in sections from Oriental sores or Delhi boils, by Dr. D. D. Cunningham, Drs. Deakin and Firth.

More lately, by advanced methods of hardening and staining, it has been rendered probable that the fuchsin bodies of Russell are coccidia. Upon careful examination of many specimens, Dr. G. Sims Woodhead has been led to believe that these resemble the coccidia group more than any other known organism. After examining specimens prepared by Soudakewich, Metchnikoff pronounces the organisms to be undoubtedly coccidia, and Soudakewich states that he has been able to demonstrate sporozoa in every one of ninety-eight cases of cancer which he had examined. On the contrary, in the latest phase of this subject, San Félice and Roncali identify the previously described bodies as belonging to the blastomycetes, or yeast fungi. Roncali believes he has demonstrated that all the forms described as coccidia or psorosperms are in reality parasites of the group blastomycetes, and that the earlier observers had made an error in classification. In a suggestive case reported by W. E. Coates blastomycetes were found in sections of an epithelioma of the lip. Plimmer has also isolated a yeast-like fungus. Nevertheless, Pellegatti declares that blastomycetes stain altogether differently from the bodies found in cancer.

The experimental transformation of cancer into sarcoma has been reported by Ehrlich and Apolant[1] during their experiments in transplanting mouse tumors. The unknown cause, or *x*-factor, was transferred to connective tissue cells, after six or more transplantations, and in one case, after the fortieth generation, the tumors took on the mixed form, and in the sixty-eighth, they were pure sarcomas. This points to a living infecting agent as the cause and also suggests that the same organism may cause different forms of tumor.

Much light has been shed upon the subject of etiology of epithelioma from studies of mouse cancer. Dr. Harvey R. Gaylord, of the New York State Cancer Hospital, at Buffalo, has reported finding spirochetes in these growths. The organisms are very small, but may be seen in living and actively moving state by the use of proper stains. They are described as being 4 to 6 microns in length, with very closely wound, abrupt gyrations of about half a micromillimeter. They are found in large numbers in the connective tissues around the tumors and occasionally among the epithelial cells, surrounded by small vacuoles. The epithelial cells seem to devour them like phagocytes, and there is evidence that metastasis may occur in this way. Cancers and sarcomas are also conveyed by fomites, since, as mentioned by Gaylord, they develop in healthy animals after prolonged confinement in cages in which infected animals had previously lived. The long time a cage retains infectivity (three years) shows the long time the organisms can retain vitality. Gaylord thinks that there is a group of numerous species of this spirochete. It is not claimed that these organisms are the cause of human cancer, but that they are found in and around mouse cancers and that these are contagious and infective. Heredity plays no part in this matter. The spontaneous cure of human cancer, of which there are numerous well authenticated cases in medical literature, is analogous to the results reported by Gaylord and Clowes, of observations upon the the spontaneous recovery in mice. In the majority of cases of alleged recovery in man, it is possible that a mistake of diagnosis had been made. The authentic cases, taken in conjunction with the immunity of recovered mice—an immunity which can be, through the serum, conferred upon other mice—brightens the prospect of discovering an antitoxin treatment for man for the cure of cancer.

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[1] Berliner klin. Woch., 1905, No. 28 and 1906, No. 2.

Trauma, and any other source of local irritation, may cause cancer, because they reduce tissue resistance. There may be numerous causes of cancer, such as toxins of organisms, excessive light, Röntgen rays, senility, or anything whereby mechanical, chemical or actinic irritation reduces tissue resistance and permits riotous growth of epithelial or endothelial cells or even connective-tissue cells.[1]

It will be perceived that the whole subject is still in a very undecided condition. As related to the inoculability, metastasis, and recurrence of cancer, I may briefly allude to the results of experiments performed by certain foreign surgeons upon the human subject. These demonstrate that if a small fragment of a tumor removed from a patient be inserted into another portion of his body, the graft will soon develop the characteristic neoplastic structure. The fact was shown to be equally true of carcinoma and sarcoma. The late Nicholas Senn, in four experiments in autoinoculation upon inoperable cases, obtained three successful results.[2] While such experiments are reprehensible, the result may be here recorded.

**Treatment.**—A suitable diet is of the utmost importance. Bread, milk, eggs, vegetables, and fruit may be freely eaten, but no meat for several months. Medicinally, morphine alone, or with atropine, must be resorted to in later stages. Dr. Herbert Snow has found that a combination with antipyrin enhances the effect of morphine and enables it to be given in smaller doses. He also believes that an association of opium, or morphine, and cocaine retards the growth and delays recurrence after operation. Jamaica dogwood may be used, whenever possible, as a substitute for opium. There is reason to believe that the morbid process can be retarded by the persistent employment of small doses of the bichloride of mercury, alternated with arsenic. Poncet reports favorable results from the hypodermic injection of corrosive sublimate into cancerous tumors. The injection of alcohol into and around the tumor has also proved of service in certain cases. It has been stated that chlorate of potassium exercises a beneficial influence. Dr. Lemoine has reported a case in which decided improvement resulted from the conjoined internal and external use of this remedy. M. Brissaud prefers chlorate of sodium, as more soluble and less toxic. Pyoktanin, by hypodermic injection or the mouth, has also seemed, in some instances, to exert a good effect. Denissenko obtained encouraging results from chelidonium. He gave internally from twenty-two to seventy-five grains (1.5 to 5 gm.) of the extract daily, injected into the growth a mixture of equal parts of the extract, glycerin, and distilled water, and if the tumor was ulcerated painted its surface with a mixture of one or two parts of the extract and one part of glycerin. Dr. E. E. Graves, of Boscawen, N. H., has reported cure by the internal administration of sulphate of magnesium. Three drachms (12 gm.) of the salt were dissolved in a pint (512 gm.) of water and a teaspoonful of the solution taken four times a day. Some regard the fluid extract of phytolacca as of service.

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[1] American Medicine, Oct., 1907, p. 560.

[2] Journal of the American Medical Association, Sept., 1901.

The best results can usually be obtained only by external treatment. The diseased tissue must be destroyed by chemical or mechanical means, and the sooner that this is done the less the probability of a recurrence. In Copenhagen, Finsen's method by means of concentrated light has been employed with encouraging results in a number of instances. The systematic use of the Röntgen rays, in the hands of experienced operators, has furnished remarkably successful results. Wm. Allen Pusey has shown that the good results are permanent, in an article, accompanied by illustrations, demonstrating the value of this method.[1] Superficial epithelioma can be extirpated by any of the various caustic preparations. The method most frequently employed is to thoroughly cauterize the lesion and the adjacent healthy tissue with caustic potash, either in the stick form or in strong solution. The part should then be mopped with diluted acetic acid, to neutralize any of the alkali that may remain, and it should then be dressed with zinc-ointment or any other soothing application. The dressing should be renewed daily, and the wound washed every morning with a weak solution of borax or common salt. In about twelve days the eschar drops off, usually leaving a healthy granulating surface, which will in mild cases heal rapidly, leaving only a small cicatrix. Acetic acid itself may be successfully employed, the crystallized acid, diluted one-half to two-thirds with water, being applied by means of a piece of wood, glass rod, or brush, every day or every second day.

Another plan that has yielded good results is to apply to the affected surface first pure phenol, and then, in a few minutes, to follow it with nitric acid or alcohol. Nitrate of silver, or potassa cum calce, may also be employed. Chloride of zinc, in paste, in solution, or in the solid form, is an effective remedy, but its application is very painful.

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[1] Journal of the American Medical Association, Jan. 11, 1908, p. 100.

M. Réclus employs the chlorate of potassium, but only as an external application. He states that it must be used for a long time, and therefore is only adapted to those cases in which the growth is slow. It is of no avail when the disease is located upon a mucous membrane.

In the case of superficial epithelioma of the face, Vidal first carefully scrapes away all the diseased tissue with the curette and covers the wound with finely powdered chlorate of potassium, then applies a dressing of absorbent cotton moistened with a concentrated solution of the same salt; over this he places a layer of some impermeable substance, such as India rubber.

Arsenic is also a valuable application. It may be employed as in the following powder, which is recommended by Esmarch: Arsenic trioxide, one part; sulphate of morphine, one part; calomel, eight parts; and powdered gum acacia, forty parts. It may also be applied in the form of Marsden's paste, which is composed of equal parts of arsenic and powdered gum acacia with sufficient water to make a soft paste. A small amount of morphine should also be added to mitigate the pain. The arsenical preparations should not be applied to mucous surfaces, nor at the same time to more than two or three square inches of the integument. Serious consequences have resulted from non-observance of these precautions.

Serra, in a contribution,[1] gives his experience in the treatment of cutaneous epithelioma by means of an application of powdered arsenic trioxide (1 gramme) dissolved in ethylic alcohol and water (āā 75 grammes). The fluid (after being well shaken) is painted freely over the diseased surface, and allowed to evaporate freely, no dressing or bandage being applied. The pain is as a rule acute, but does not last long; fresh applications are made each day over the yellowish crust, which is not disturbed. The strength of the solution is increased to 1 in 80, and after the tenth or fifteenth application, the crust (which has become darker) may be detached, and fresh solution applied to the wound. If after this application the crust is only very slight and easily removed, one may conclude the diseased tissue is destroyed, and the wound may be treated on ordinary lines.

Good effects have also been secured by a paste introduced by Dr. Bougard, of Brussels, the composition of which is as follows: Wheat flour, sixty parts; starch, sixty parts; arsenic trioxide, one part; cinnabar, five parts; ammonium chloride, five parts; mercuric chloride, one-half part; saturated solution of zinc chloride, two hundred and forty-five parts. The first six substances having been separately ground to fine powder and mixed in a mortar, the solution of zinc chloride is added slowly while the contents are rapidly stirred. The soft mass is then poured into an earthen pot, and if covered will keep for several months. Cerny and Trunecek advocate the use of arsenic trioxide dissolved in equal parts of alcohol and distilled water, in the proportion of one to one hundred and fifty. Gravino claims satisfactory results from an application of ten parts of fuming nitric acid and four parts of corrosive sublimate, brought to the consistence of a syrup by the addition of bibulous paper. Darier reports excellent results from the successive application of methyl blue and chromic acid. The solution of the former contains fifteen grains (1 gm.) in one and a quarter drachm (5 gm.) each of alcohol and glycerin. The solution of chromic acid is of the strength of one to five. Pyrogallic acid in the form of a ten- or twenty-per-cent. ointment is recommended. It must be applied continuously for six or eight days. The ethylate of sodium is a valuable remedy. I have obtained excellent results in obstinate cases from the application of an infusion of jequirity. The inflammation was enormous, but when the sloughs dropped off the underlying tissues presented no trace of the disease, and perfect recovery ensued. Resorcin has in some cases exercised a beneficial influence, applied in the form of ointment containing two or three drachms (8 to 12 gm.) to the ounce (32 gm.), or in some instances powdered upon the affected surface. Silver nitrate has been successfully employed. In many cases it will be advisable to curette before resorting to the caustic. One of the best local remedies is thymol iodide. It is employed in the form of powder, or ointment containing fifty per cent. or more. Other remedies which have been used with more or less success are iron subcarbonate, boric acid, lactic acid, and thuja occidentalis. A tincture of the last-named substance is painted over the growth every second or third day, or the surface is medicated with a spray consisting of the following mixture:

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[1] La Riforma Medica, May 25, 1907.

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|---|---|
| ℞ Tinct. thuj. occidentalis ......... | 5 grammes. |
| Aq. destillatæ .................. | 100 grammes. |
| Glycerini ...................... | 10 grammes. M. |

At the same time the tincture of thuja is given internally in daily doses of ten to sixty drops. Lactic acid has been successfully used, made into a paste containing fifty per cent. or more and applied once a day. Cases have been observed in which an attack of erysipelas was followed by improvement in epithelioma or other forms of carcinoma. In view of this fact it has been proposed to inoculate the ulcer with a culture of the streptococcus of erysipelas. Some cases have been published in which this procedure was executed, but the result was not encouraging. Although at first improvement was manifested, the erysipelas became chronic, and eventually death occurred at an earlier period than if the case had been treated by the usual methods. Remarkably successful results have been recently obtained by the judicious application of the x-rays. The technic is so important that the reader is referred to the text books on this subject, which contain voluminous directions to ensure success. The actual cautery or the galvano-cautery has been employed with benefit in cases where, owing to the situation of the lesion, other methods could not be used. The dermal curette may be used with advantage in many cases.

Lewis Jones[1] advocates the treatment of epithelioma by zinc ions, the basis of which is the application of the metal by means of the galvanic current. The positive electrode of a galvanic battery is provided with a cotton swab, which is saturated in a solution of zinc sulphate and then applied to the ulcerated surface, while the negative electrode is applied at some other convenient portion of the body. The salt is decomposed by the electric current, so that the zinc collects about the positive pole and penetrates further into the tissues than by any other method. If, in the case of sensitive persons, the application is painful, the ulcerated surface may be swabbed over with a solution of cocaine. It is claimed that a single application lasting about ten minutes is sufficient to cure the ulcer which has been thus converted into an ordinary granulating surface which heals under the usual methods of treatment. A number of successful cases are reported by the author with this method, which seems particularly applicable where the disease is still more or less confined to the superficial layers of the skin.

Many authorities agree with Dr. Clowes, of Buffalo, that experimental research with mouse cancer goes to prove that a growing cancer produces in the serum a force which is antagonistic to the development of cancer. The presence of these antibodies in the blood may bring about, in rare cases, a spontaneous cure. This would suggest that a curative serum treatment of cancer may be discovered.

The deep-seated and the papillary varieties of epithelioma can be successfully extirpated only by the knife. Thorough and early excision, followed by the transplantation of a flap of sound skin, is a procedure that has, in the hands of many careful surgeons, given brilliant results. After the neighboring lymphatic glands become implicated all operations are futile, but the fetor of the discharge may be lessened and the pain somewhat relieved by the daily use of a weak citric acid lotion.

Related lymphatic glands should be excised with the growth, since they become involved long before any obvious enlargement is noticed. Recurrence may in this way be prevented. This is the experience of every judicious surgeon; and the microscopical studies of Heidenhain have shown that if the neoplasm has been thoroughly removed the disease is not likely to return in the wound. In cases unamenable to surgical interference, dressings containing opium, stramonium, conium, or cocaine may be prescribed in order to assuage pain. Fetor may be overcome by salicylic or tannic acid, permanganate of potassium, creolin, or betanaphthol.

THYMUS GLAND TREATMENT OF CANCER.—Gwyer makes a preliminary report on the treatment of cancer with thymus gland, and reports a case of inoperable cancer of the breast in which this treatment gave the patient great relief from symptoms. The gland is given either dried, and ground to powder, or as a watery extract of nucleo-proteids and other elements. The dose of the powder varies from 1 to 4 drachms, three or four times a day. Sodium phosphate, half an ounce, is given once a day to produce elimination. Gwyer also refers to a number of other cases in which marked benefit resulted from this treatment. It diminishes or eliminates pain and lessens the size of the growth. Every patient so far treated had been considered beyond operation, and beyond hope of cure.

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[1] Brit. Med. Journ., 1907, No. 7.

**Prognosis.**—The prognosis varies with the age of the patient, the form, duration, and location of the disease, and the presence or absence of glandular involvement. The superficial variety may remain for years without affecting the general health, and if the lesions be thoroughly removed will usually not recur. The deep-seated variety is always a grave disease. It pursues a rapid downward course, if let alone, and frequently recurs after attempted extirpation. The papillary variety is the most malignant form of the disease. It almost invariably recurs after operation, and ends fatally within a year or two from its first development. In epithelioma of the tongue and of the mucous membranes the prognosis is also bad. Involvement of the lymphatic glands points to a fatal termination of the disease. The older the patient the worse the prognosis. Degenerative processes once initiated in the very aged tend to continue, and removal of the epitheliomatous lesion in such patients does not usually arrest the progress of the disease.

BENIGN CYSTIC EPITHELIOMA.—There is a rare form of epithelioma, affecting the skin and muco-cutaneous borders, which pursues such a relatively mild clinical course, that it has received the name of benign, cystic epithelioma. It has also been discussed under other titles, such as tricho-epithelioma, hydradenoma, hemangeio-endothelioma, syringo-cystoma, epithelioma adenoides cysticum, Schweiss-drusen adenom, adenoma of the sweat-glands, etc.

Microscopic studies of a case, which was under my care at the Medico-Chirurgical Hospital, in 1906, in which I was favored by having the expert assistance of Professor L. Napoleon Boston, demonstrated conclusively that these neoplasms originate in the lower layers of the derma, and especially from the hair-follicles. The growths have the characters of epithelioma, and are not correctly described under the title of adenoma. It was impossible to demonstrate any connection between the new-growths of epithelium and the glandular tissue of the sebaceous glands. A characteristic feature of the structure was the development of small cysts, especially in the older parts of the growths.[1]

The clinical history is that of slowly developing nodules in the skin. As these increase in size they tend to coalesce so as to form flattened masses, extending under and in the skin like a chain of lymphatic glands.

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[1] Journal of the American Medical Association, vol. xlvii, p. 1147.

They attain the size of a hazel nut, or larger, and are not papillary or wart-like upon the surface but smooth, and somewhat pigmented. The pigment-deposit may be noticed sometime before the growths develop so as to be distinguishable. They are not accompanied by pain; but after violent exercise irritation may be noticed, accompanied by paresthesia, or itching sensations. Surrounding lymphatic glands may sympathetically enlarge, and ultimately become secondarily affected by epithelioma.

The patient's general health does not seem to be materially affected, although in the case which I reported, Dr. Boston found slight deficiency of the red-cells (3,800,000 per c.mm.) with hemoglobin 75 per cent.

Under the title of "calcifying epithelioma" a peculiar growth has been described by M. Malherbe and M. Chenantais. These authors found their report upon a series of twelve cases. Mr. Jonathan Hutchinson, Jr., speaks of a similar growth as calcifying adenoma. The latter tumor, removed from the forearm of an elderly man, was as hard as bone. When decalcified the structure resembled compressed and calcified glandular tissue. No cyst wall was present. The name epithelioma for such cases seems misapplied, and therefore is rejected by Hutchinson, as the neoplasm manifests no malignancy.

The *treatment* is successful by excision of the growths. It is possible, however, that if in a favorable locality they would also be amenable to x-radiation.

## SARCOMA CUTIS.

SYNONYMS.—Cutaneous sarcoma—Sarcoma of the skin.

Sarcoma cutis is a malignant disease, characterized by the formation of sarcomatous new growths in the skin and subcutaneous connective tissue.

**Symptoms.**—In some rare cases the internal organs are those which are first affected and the integument is involved secondarily, but in the majority the skin is the primary seat of the disease. The symptoms vary in accordance with the type of the malady. In non-pigmented sarcoma, which is the least malignant variety, the new growths are usually single, and limited to the superficial tissues. They first appear as small, round, firm nodules of a reddish or pink color, varying in size from a pea to that of a hazel-nut. They are usually found in the apparently healthy skin, but in some cases they are situated upon a pre-existing mole, wart, or cicatrix. Sarcoma of the skin may develop from an irritated nevus. The lesions grow rapidly, and frequently attain the size of an orange, but eventually break down and ulcerate. They are not painful, however, and do not involve the general system, or at least do not for several years.

In melanotic sarcoma, which is the variety most frequently met with, the new growths are numerous and exquisitely painful. They consist of small, round, hard nodules that vary in color from brown to blue and black. The nodules usually first appear upon the skin of the hands, feet, and genital regions, but rapidly extending, increasing in number and size, they invade every portion of the body. Occasionally some of the lesions disappear by absorption, leaving a pigmented cicatrix to mark their former place. More frequently, however, the adjacent nodules coalescing form large, irregular masses, which become the seat of ulceration. Finally, the internal organs become infiltrated with similar masses, and the patient dies of exhaustion. This is the most malignant form of the disease.

A very interesting case of primary melano-sarcoma of the vulva has been described[1] by Dr. R. W. Taylor. The tumors of the vulva, two in number, were excised. A course of hypodermic injections of Fowler's solution into a mass of infiltrated glands of the groin was undertaken some months subsequently. The injections were given for two months, when the remedy was administered by the mouth. The result of three months' treatment by arsenic was the perceptible subsidence of the tumor. Death, however, occurred thirteen months after the operation, preceded by symptoms denotive of metastasis to the lower part of the pons.

"A Peculiar Case of Pigmented Sarcoma" has been described by Dr. Phineas S. Abraham,[2] in which the new growth consisted mainly of small round cells. Death followed in eight or nine months after the appearance of the disease. J. C. Wilson and F. J. Kalteyer[3] report a case of a woman 26 years of age, who had a pigmented mole on her forehead. As the result of an injury this became inflamed and was extirpated, followed by a normal cicatrix. About a year afterwards, nodules appeared in the skin, and pain was experienced over the liver. Urine contained albumin and melanin. Death of the patient soon followed. Spleen and inguinal glands were enlarged, liver also was affected.

Dr. Karewski has reported a case of an infant born with small sarcomatous tumors irregularly distributed over the entire surface of the body, and which increased in size as the child grew.

An extremely rapid development of multiple sarcomata, observed in the clinic of Professor Polotebnoff, has been reported by Dr. H. V. Trushennikoff. After an attack of pleuro-pneumonia a man thirty-seven years of age observed two small tumors on his left breast. These enlarged and others appeared. Six weeks later as many as two hundred, from the size of a pea to that of an egg, were scattered over the whole body. His death occurred in a few days. Sarcomata were found in the lungs, pancreas, dura mater, thyroid, kidneys, and cranial bones. They were of the round-celled variety.[4]

**Diagnosis.**—Sarcoma cutis may appear at any time after puberty, but it is rarely observed in persons under forty years of age. Its symptoms are so characteristic that there is little danger of confounding it with any other malady.

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[1] New York Medical Journal, July 6, 1889.

[2] The British Medical Journal, January 2, 1892.

[3] New York Med. Jour., Nov. 21, 1903.

[4] Lancet, March 22, 1890.

*Carcinoma* and *lymphadenoma* present some points of resemblance to it, but the lymphatic glands are involved in both these diseases and are unaffected in sarcoma.

It might be mistaken at first for an anomalous form of *lepra*, but the anesthesia, atrophy, and deformity of that disease are absent here.

Finally, sarcoma can be readily distinguished from *lupus* and *syphilis* by the consideration of the history of the case and the character of the lesions, and especially by the microscope.

**Pathology.**—The new growths are embedded in the corium and subcutaneous connective tissue, and are identical in structure with those that occur in sarcoma of other organs and tissues.

They are composed of spindle-shaped cells, or large and small round cells, which are closely packed together and frequently enveloped by a delicate reticulated layer of connective tissue. They are richly supplied with blood-vessels.

The melanotic growths contain an abundance of pigmented cells and pigment-granules.

According to the researches of Dr. Felix Lagrange, the pigment is very unequally distributed. While in some of the cells it is entirely absent, others are so full as to merely appear like black, round masses. The melanine, which he succeeded in separating, existed in three principal forms: as black masses formed by the coalescence of granules; as fine disseminate granules which were round and very numerous; and as small particles of irregular shape, but for the most part angular, and differing considerably among themselves as regards form and size.

Professor Campana, of Genoa, states that sarcomata of the skin are generally associated with growths of the same nature situated upon the peripheral nerves, and that the nerve-tumors are often the first to develop.

**Etiology.**—Notwithstanding the theories advanced on this subject, the cause of sarcoma is still unknown. It is probable that a disturbance of the trophic system is the chief factor in its production. The lesions of the skin may be secondary to sarcoma of the nerve-trunks or of the internal organs.

According to Professor Campana, the multiplication of tumors occurs through sarcomatous changes in nerve-fibres, by which the disease is transferred from one site to another.[1]

**Treatment.**—The treatment has been very unsatisfactory. When the tumors are single or few, the best results are obtained from their prompt excision. This procedure is useless, however, when the growths are numerous, and impossible when they involve the internal organs. In such cases life may be prolonged and pain lessened by the administration of small doses of trioxide of arsenic in alternation with bichloride of mercury, and by

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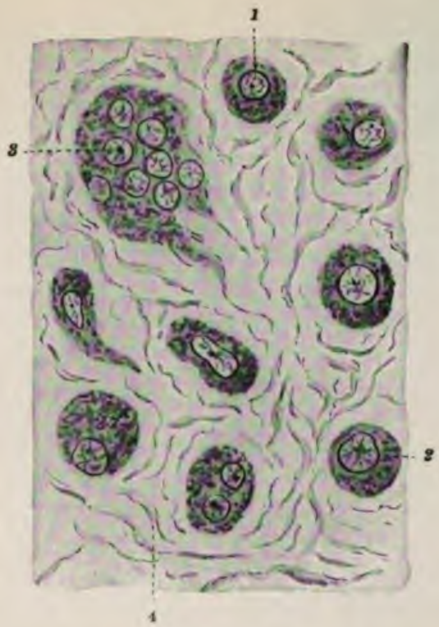
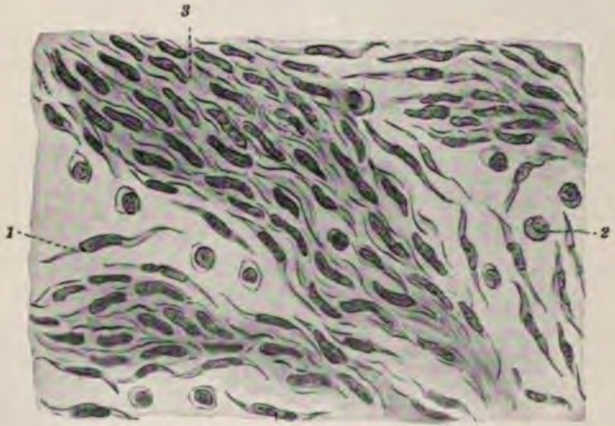
[1] British Medical Journal, October 13, 1888.

## PLATE XXV



Large Round-celled Sarcoma.

1, Large round cell with coarse protoplasm
2, Polygonal cell.
3, Chorioplaque.
4, Fibrous stroma. (See page 768)



Neurofibroma Cells. (See page 800)

1, Spindle-shaped connective tissue cell.
2, Round and polygonal cells.
3, Mass of spindle cells.

restricting the patient to a diet of milk and vegetables. Marked improvement has in certain instances followed the hypodermic injection of arsenic. If ulceration has taken place, a dressing of thymol iodide may be used. In the final stage, sufficient morphine should be given to make the patient comfortable.

Sarcoma, like epithelioma, is in rare instances cured by erysipelas. Three such cases are reported by Bruns. Dr. Langenbuch observed a cure of multiple sarcomata of the skin in consequence of erysipelas.[1] A large growth had been excised, had recurred, and a second still larger tumor had developed in another situation, while about fifty small tumors of various sizes were in existence. The man was suddenly attacked by erysipelas, and within about eight days all these tumors had vanished. Their rapid decrease was evident on the third day, and by the fifth was completed. Dr. Kleeblatt has published an account of a lymphosarcoma and a lymphadenoma which speedily disappeared after an attack of erysipelas. With a view, therefore, of promoting the retrocession of malignant formations, Kleeblatt and others have practised inoculation with the erysipelas coccus. While, however, in some instances this method has been signally successful, in others it was followed by severe and even fatal consequences. Inasmuch as both sarcoma and carcinoma lead almost invariably to death, and are productive, moreover, of great suffering, the danger of inoculation might be considered as justified by a fair prospect of cure. It is thought that the coccus of erysipelas is directly destructive to the cells of malignant growths. Dr. W. B. Coley, of New York, advocates the injection, in inoperable sarcoma, of the mixed toxins of the streptococcus of erysipelas and the bacillus prodigiosus. Following a similar course of thought, Von Mosetig-Moorhof, of Vienna, has sought by other means to attain the same object. He has for a number of years endeavored to find an agent capable of arresting the morbid proliferation of cells through a special influence upon their nuclei. After a limited, but to a certain degree encouraging, experience with the injection of anilinum trichloratum, he turned his attention to pyoktanin. At a meeting of the Royal-Imperial Society of Physicians of Vienna he gave an outline of the results obtained in several sarcomata beyond the reach of surgical interference. In five cases of sarcoma and one of papilloma of the bladder, he had obtained promising results, and, to say the least, further investigation in the same direction is warranted. His practice was to inject into the neoplasms six grammes at each *séance* of a 1 to 500 solution of pyoktanin, which was in some cases increased to 1 to 300. The injections were made into the tumor and its neighborhood, antiseptic precautions being always observed. No constitutional symptoms were produced. A case of multiple sarcoma has been reported by Köbner in which a cure followed the hypodermic injection of arsenic trioxide maintained for about a year. A case of hemorrhagic sarcoma, with multiple generalized lesions of the skin, was treated successfully at the Bellevue Hospital, New York,[1] with hypodermic injection of cacodylate of sodium.

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[1] Deutsche medizinische Wochenschrift, December 25, 1891; Medical Bulletin, April, 1891.

**Prognosis.**—The prognosis is bad. Medicinal treatment is only palliative, and, while early excision of the tumors may retard the progress of the disease, recurrence of it is usual, the patient generally dying from pain and exhaustion within three or four years from the first appearance of the lesions.

## CARCINOMA CUTIS.

SYNONYMS.—Cutaneous carcinoma—Cancer of the skin.

Carcinoma cutis is a malignant disease characterized by the formation and deposition of carcinomatous material in the skin and subcutaneous connective tissue. Under certain conditions, which are not well understood, it appears to be both inoculable and contagious.

**Symptoms.**—The skin may be attacked by any of the varieties of carcinoma, but those most frequently observed are epithelioma, scirrhus, and melanosis. The first is always a primary affection of the skin or of the mucous membranes. It has already received a separate consideration. Melanosis also is generally a primary affection of the integument. Scirrhus of the skin is usually secondary to similar growths in other organs and tissues. Daus has tabulated 38 cases in which a primary internal cancer was followed by metastatic growth in the skin. In rare cases it appears, so far as we can judge, to be developed primarily in the skin. Two varieties of scirrhus have been observed upon the skin, the lenticular and the tuberous.

The lenticular variety is always secondary, and occurs most frequently in connection with carcinoma of the mammary glands. It is characterized by the development in the skin of several small, hard papules or nodules that vary in size from a small shot to a bean. They are slightly elevated above the surrounding surface. The lesions vary in color from pink to dark brown, and are surrounded by an inflammatory areola. They rapidly increase in size and number, and as the disease progresses the adjacent papules and nodules coalesce, and form large, irregular masses or fungoid tumors. In some cases the entire surface of the chest is infiltrated with the carcinomatous deposits, numerous nodules are developed, and the intervening skin becomes thickened and indurated, so that the thorax seems to the touch to be encased in armor. This is the condition described by Velpeau as *"cancer en cuirasse."* After a time, owing to the increasing pressure of the new material upon the cutaneous vessels, the vascular supply is diminished or cut off from the affected parts. Some of the nodules then undergo ulceration, others become gangrenous, and may be spontaneously extruded. Fresh nodules, however, are developed in other portions of the body, the lymphatic glands become hard and smaller, nutrition is interfered with, the patient becomes more and more emaciated, and finally perishes from exhaustion. More or less lancinating pain is present from the beginning to the end of the disease.

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[1] NOTE.—Melanosis is not necessarily malignant. For example, J. Clarke Stewart reports a case of benign melanosis in the Journal of the American Medical Association for July 20, 1907.

The tuberous variety is generally a secondary affection, but may make its first appearance in the skin. The lesions consist of large, hard nodules and tubercles that vary from the size of a bean to that of a walnut, or may be larger. They project above the adjacent cutaneous surface. The lesions vary in color from white to dark red or brown, and are generally present in large numbers. They are found on every portion of the body, but are especially abundant upon the hands and face. Their course is similar to the lesions of the lenticular variety. Ulceration, emaciation, pain, and exhaustion end the scene within a few years.

Melanotic carcinoma is characterized by the development in the skin of numerous small, hard, blackish papules or nodules. They are usually first observed on the hands, feet, or the genital regions. They increase rapidly in size and number, and soon involve the whole lymphatic system. The internal organs also become affected, and the patient finally dies of pain and inanition. This is the most malignant variety of carcinoma, and often ends fatally within a year from the first appearance of its lesions.

**Diagnosis.**—The only diseases with which carcinoma could be confounded are sarcoma and lymphadenoma. *Sarcoma,* however, never attacks the lymphatic glands, while carcinoma, even at an early stage invades these structures. *Lymphadenoma* involves the lymphatic system also, but it is a painless disease of long duration, and usually makes its first appearance in the cervical glands. Carcinoma, on the contrary, is of comparatively brief duration, is accompanied by more or less pain and by marked emaciation, and the cervical glands are not so conspicuously enlarged.

**Pathology.**—The lesions of cutaneous carcinoma are composed of a dense network of connective tissue arranged in alveolar masses, the meshes of which are filled with numbers of small, round, epithelial cells.

**Etiology.**—The cause of carcinoma is still involved in mystery, but it is probably a protozoan parasite. The most plausible theory of its production is that which supposes it to be due to a disturbance of the functions of the trophic system. Certain affections of the skin appear to favor the development of cancer. Among these pre-cancerous "affections," Hartzell especially names inflammations peculiar to workers in tar and paraffine, chimney sweep's dermatitis, and lupus vulgaris, and erythematosis. Ulcerating lesions of tertiary syphilis, chronic leg-ulcer, and cicatrices from burns or any other cause; cutaneous horns, and senile keratoma form an important group. The senile keratoma of Besnier, forms dry crusts on the forehead, cheeks, nose or backs of the hands, which in a few cases, ulcerate and become cancerous, forming a papillomatous epithelioma.

**Treatment.**—The treatment of cutaneous carcinoma is very unsatisfactory. Excision of the nodules is painful, and will not retard the progress of the disease. Internal medication seems to be equally powerless to effect a cure. Considerable relief, however, can be afforded by eliminating all meat from the patient's diet, and administering small doses of arsenic in alternation with the bichloride of mercury. Morphine must also be given when necessary. In young subjects these tumors sometimes recede. The best results have been obtained from the judicious treatment by the x-rays, especially in cases of epithelioma.

Von Leyden and Blumenthal[1] have observed that cancer tissue is especially susceptible to digestion, and destruction by trypsin, the proteolytic ferment of the pancreas. Beard[2] has suggested parenchymatous injections of a solution of this substance. The solution is prepared by Fairchild especially for this purpose, "injectio trypsini," of which the dose ranges from five to twenty minims.[3] The injections may be given exceptionally twice a day, but as the rule every second day. In some cases a chill and rise of temperature have been noticed. This reaction is not thought to be directly due to the injection itself but is attributed to the absorption of the cancerous substance which has been attacked and digested by the trypsin. In many cases, favorable results have been reported, in reduction in size of the lesions, diminished pain, etc. The treatment should be carried out aseptically, and it is well to begin with five-minim injections every other day, shortly increasing to ten minims or twenty minims. If marked disturbances are observed—nausea, etc.—Dr. Beard suggests the temporary substitution of pancreas diastase, amylopsin. The internal administration of the pancreatic preparations may be carried on in conjunction with the hypodermic use of these agents.

The different cancer remedies that have been recommended only to be forgotten, together with those that are being tried all over the civilized world, are almost as numerous as the cancer patients. Some of these remedies have been lauded to the skies and cases have been reported by some as permanently cured; yet other men, whose diagnosis could not be refuted, and who have tested such remedies with impartiality, have had no success with them at all. Such instances lead us to believe that the disease in such favorable cases was not of a true cancerous type, being probably a benign epithelial tumor.

Skin cancer, not of a rapid, progressive type, may often be destroyed, entirely, in its incipiency, by the use of a caustic or an escharotic.

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[1] British Medical Journal, May 13, 1905.

[2] British Medical Journal, Jan. 20, 1906.

[3] See also "Trypsin Injections," New York Medical Journal, March 2, 1907, p. 385.

It is also true that some cancers have a natural fluctuation in the rate of progress of the malady, and any remedy that may be applied to such a tumor during its stage of arrest will receive the credit of arresting the development of a cancer.

Malignant disease is subject to great variations. A cancer may have its origin in some tissue and rapidly destroy the life of the patient, while a cancer equally as malignant may, in another patient, exist for twenty or more years and the patient may die of some intercurrent disease. Great differences occur in different patients. Sometimes such differences may occur in different tissues in the same patient. Cases have been reported where the arrest of progress was permanent, and where an enormous mass dwindled down to nothing. The removal of a cancer by surgical means, or by the x-rays, is often followed by a recurrence, and yet the recurrent nodules have disappeared spontaneously. Had the administration of some of the belauded remedies coincided with the amelioration of the cancer, then it would be only natural to credit the drug with the success, which is probably often the way in which drugs gain their reputation. Another way by which drugs gain their reputation is through the possibility of error in diagnosis. Expert clinicians sometimes consider a tumor malignant, and on microscopic examination it is difficult to determine whether or not the tumor really is malignant. How much more difficult is it to always absolutely recognize a tumor as malignant in the living subject? Especially is this true with men whose opportunity to study the pathology of tumors is not as abundant as that of the men who make it a lifelong business. The "cancer doctor" considers and treats all swellings and tumors as cancerous, and thus gains his reputation.

It is unfair to the patient to use drugs indiscriminately in the treatment of cancer. Only such drugs as have given results after testing and retesting should be employed for the cure of cancer.

While there is no absolute cure for malignant disease, yet I believe that early and free excision of the tumor, followed a few days later by a careful and cautious treatment with the x-rays to destroy any cancerous tissue of the lymphatic system that may not have been removed by the knife, is better than any drugs or means thus far employed. Indeed, this treatment will not always prolong life, yet my experience and success have taught me to employ this treatment in order to give the most to the unfortunate class of patients.

## KELOID.

SYNONYMS.—Kelis—Kelos—Cheloïde—Knollenkrebs.

Keloid, as described by Alibert, is characterized by the presence of flat, round, or irregularly shaped and variously sized, elevated, white, or pale-red, smooth, firm, but somewhat elastic nodules or patches, ridges, or projections of new growth of connective tissue. It is a benign, fibrocellular neoplasm. It may be either primary or "true" keloid, or secondary keloid, following trauma.

**Symptoms.**—The disease begins as a small, pale pea- or ordinary bean-sized tubercle or nodule, well imbedded, but yet slightly elevated above the skin. The growth, which may be single or multiple, usually presents at first but one tumor. This slowly increases in size, varying much from time to time in form, appearing now as an oval tumor sending forth projections into the surrounding skin, contracting and distorting the part (the central portion and the processes of the tumor resembling the body and legs of the crab), and anon as a simple ovoid or nodular tumor having no projections whatever into the healthy skin. Sometimes the tumor is elongated, cylindrical, or else appears as discs or plates, or as cord-like elevations, bands, or ridges, forming a star-shaped or radiating network, assuming protean forms in the skin. It may follow a scar (cicatricial keloid), or acne lesions (acne keloid).

The tumor varies not only in form but in size, which may range from that of a small pea or bean to that of a large turnip. The lesion sometimes appears about the size of a well-filled pea- or bean-pod and is always well defined, looking as if implanted in the skin, but really elevated from one-half to several lines above it. The usually prominent central part or body of the lesion is surrounded by radii which plunge from its periphery under the skin, extending like roots into and appearing to be lost in the tissue of the part. Now and then the central part or body is somewhat depressed, and the border elevated as a rim around it. In color it may be white and shiny, or of a pink or reddish patchy effect. Its surface is smooth, the epidermis covering it being thin and tense, or else wrinkled, hairs and sebaceous glands being usually absent. Although only a few may be met with, the sweat-glands in some cases are present in large numbers. To the touch the tumor is firm but elastic, the central portion being denser and harder than the circumference, the processes having all the rigidity of bands of fibrous tissue. It generally occurs, as has been mentioned, singly, but sometimes two or more patches may be observed. The situation in which the tumor is most frequently met with is the trunk, especially the sternum, the sides of the chest, the mammæ, the back, and the anterior and posterior parts of the neck. In the majority of cases keloid occurs on the sternum, from which it may spread out processes parallel with the ribs. It is also met with on other parts of the body, but least frequently on the face, concha, and lobule of the ear, the flexor and extensor surfaces, the genitals, and the dorsal portions of the hand and foot. Pain, as has been stated, follows pressure upon the tumor. Pain from it may also be spontaneous, of a pricking or burning character, and sometimes itching is experienced. These symptoms are seldom constant, but occasionally the pain may be so steady as to be annoying. The lesion of keloid, once formed, generally continues throughout life, its course being either rapid or slow, usually slow. After the tumor has attained a certain size its further growth is likely to be arrested, and, if that happens, it becomes stationary. Keloid never ulcerates, and it shows no tendency to undergo any change, save in the rare cases in which complete involution occurs. Exceptionally, it may become the site of cancer-growth.

**Diagnosis.**—The diagnosis of keloid is, as a general rule, easy; its course, characteristic appearance, and location being usually sufficient to distinguish it from any other affection. Keloid may be confounded with *simple cicatrix,* from which, however, it may be distinguished by its course, form, color, consistency, pain on pressure, the frequent recurrence of spontaneous pain, and sometimes by the sensation of itching.

**Pathology.**—True keloid is a new growth of connective tissue situated in the corium. The growth is composed of closely packed fibres that are generally arranged parallel to the surface of the tumor. Upon examination of several specimens removed from a negro with true keloid, the following observation was made:

The horny and mucous layers of the epidermis and the papillæ appeared normal. Beneath the papillæ there was a new formation consisting of connective-tissue bands, the fibres of which were densely packed together, and ran parallel with the long axis of the growth and the surface of the skin. A few spindle-cells or nuclei were apparent. Along the vessels, especially the arteries, the sebaceous and sweat glands had entirely disappeared. In addition to the above changes, Piffard records thinning of the horny layer, the rete as rather over-developed, and the papillæ as enlarged, with broad, flat tops. Schwimmer[1] reports also atrophy of the epidermis, absence of the papillæ, with atrophy of the hair-follicles and sebaceous glands. Warren[2] and Neumann have both proved that the disease primarily originates in the blood-vessels of the part.

In two cases, Leloir and Vidal carefully examined nerve-fibres taken from the periphery of the growth, but failed to find any alteration. Notwithstanding repeated examinations, they failed to detect any microbes in keloid tissue.

**Etiology.**—Keloid occurs in both sexes and at all ages, but more commonly in persons in middle life, begining usually at puberty. It may develop spontaneously, or follow an irritation, injury, or a simple hypertrophic scar. In true spontaneous or idiopathic keloid the glands of the skin are more or less perfectly retained. A slight moisture over the growth may be perceived when perspiration is abundant upon other parts of the body. The administration of pilocarpine will, as Leloir states, demonstrate that in this form of neoplasm the sudoriparous glands are not entirely obliterated. The true keloid involves the skin only and is always movable upon the underlying tissue. It may be insensitive, but is generally sensitive, and sometimes quite painful. True keloid does not, as a rule, involve so extensive a surface as that variety which develops after an injury. A few instances are known in which idiopathic keloid has undergone spontaneous absorption. This form generally occurs in persons of neurotic temperament, which suggests that it may be regarded as a tropho-neurosis. It is possible, however, that even this so-called spontaneous keloid may have in acne its point of departure, since in microscopical examinations round cells have been observed around the degenerated hair-follicles and sebaceous glands.[1] An interesting case reported by de Amicis, of Naples, may be mentioned in this connection. The patient was a nervous young woman who, one year before coming under observation, had been attacked by a symmetrical eruption located upon the trunk and lower extremities. The tumors were three hundred and eighteen in number, small pinkish elevations the size of millet-seeds. There was no history of injury. The temperament of the patient and the symmetrical distribution pointed to a nervous origin. As lending probability to the theory of a neuropathic origin, I may add that Kahler has seen keloid develop upon the upper extremities and shoulders in cases of syringomyelia. Keloid has been noticed to follow, especially in the negro, who is predisposed to the disease, an injury to the integument from the lash of a whip, strap, or other instrument; from burns, blisters, or punctures; from the bite of the leech or the piercing of the ears.

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[1] Abstract in Philadelphia Medical Times, September 10, 1881.

[2] Sitzungsbericht der k. Akademie der Wissenschaft, 1868.

Dr. J. Block, of Kansas City, witnessed a case in which keloid occurred a few months after the patient had been burned by lightning.

Dr. James Collins, of Philadelphia, recorded[2] the case of a negress, who died aged ninety years, in whom keloid existed upon the breast, neck, shoulders, and over the ribs of each side. The nodules upon the breast followed a burn which she experienced at the age of fourteen; that upon the neck developed after the removal of a small tumor; those upon the shoulders resulted from the application of a blister; while the growths over the ribs were produced by the lash. Keloid may follow from boils, carbuncles, pustules, especially those of varicella and variola, acne, lupus (after scraping),[3] psoriasis,[4] and from syphilitic and scrofulous eruptions. Cases are also recorded in which keloid appeared after operations and wounds. F. Jones[5] reported a case of a negro who developed extensive keloids after he had been bitten severely by another negro.

An instance in which a large, true keloid of the forearm had followed a most insignificant wound, a mere scratch of the skin, came under my observation in the case of a practitioner who, exposing his right arm during one of my clinics, stated that the affection had followed a very slight abrasion of the part while he was attending a case of confinement. Tschlenow,[1] of Moscow, says that clinical and histologic studies show that a marked distinction between primary and secondary keloid is not based on facts. Both have the same type of development: histologic alterations or marked increase of the connective tissue with decrease of the elastic tissues along the blood-vessels. The cutis is to be regarded as a particular starting point of this growth. Its etiology is obscure. The chief factor seems to be a special, personal, family or racial predisposition, under the influences of which the skin reacts in keloid formations from slight irritation, not, however, to every irritation or in every part. This explains also the remarkable tendency to relapses. As regards the pathology, the vascular system undoubtedly plays a large part, but further investigations are needed. Keloid is neither a scar, nor simple hyperplasia of the connective tissue. It is different in its structure from infectious granuloma and fibroma, but its proper classification is still impossible. The cause for its spontaneous cessation of growth is unknown. Its prognosis is generally not very satisfactory and the treatment is usually a thankless task.

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[1] H. Leloir and E. Vidal in Annales de Dermatologie et de Syphiligraphie, March 25, 1890.

[2] University Medical Magazine, October, 1889.

[3] "Keloid after Scraping," cases reported by Mr. Clutton, Mr. Lucas, and Mr. Baker. British Medical Journal, January 20, 1883.

[4] "Keloid following Psoriasis," reported by Henry S. Purdon, M.D. Journal of Cutaneous and Venereal Diseases, April, 1883.

[5] Memphis Medical Monthly, July, 1903.

The resemblance of some of the lesions to lupus, suggests a relationship to tuberculosis; the disease possibly being para-tuberculous at least in some cases, and due to the toxins coming from tubercular deposits in remote organs. Its occurrence after surgical operation and traumatism suggests a possible local infection, in some instances.

**Treatment.**—Internal and external treatment are seldom of much avail, either to lessen, remove, or destroy the growth. The paroxysmal pains and the deformity that the disease occasions often cause patients to ask for relief, and then it becomes necessary to attempt some treatment that may fulfill both indications. The pains may sometimes be lessened by full doses of quinine. Wilson prefers first to regulate the general functions of the system, to this end maintaining a steady course of Donovan's solution in doses of ten drops three times a day, or of the protiodide of mercury in combination with guaiacum and the oxysulphuret of antimony. Codliver oil, arsenic, the chloride of ammonium, the iodide of potassium, and the other alkaline iodides are remedies that have been recommended as sometimes having an influence on the growth.

The injection of morphine and cocaine in or around the growth is often serviceable for the pains. The application of chloroform, aconite, and camphor, alone or combined with belladonna, opium, and arnica, may also lessen or relieve the pain. Hot and cold applications may be employed for the same purpose. The pain is sometimes allayed by the galvanic current or occasionally puncturing the tumor with a small knife, which also assists in promoting absorption. Vidal, in order to attain the same end, employs multiple scarification, from which mode of treatment he reports for several cases relief from pain. The incisions are made in such a manner as to cross each other at right angles or obliquely, thus dividing as large a number as possible of the imprisoned nerve fibrils. They are carried through the entire thickness of the growth. Prior to the operation, local anesthesia is obtained by the application of liquefied chloride of methyl as a spray, until the tumor has become of a dull-white color from the freezing. Pledgets of absorbent cotton are sufficient to arrest the bleeding. The day after the operation a dressing of cotton, soaked in a solution of boric acid, is placed upon the surface. On the succeeding day, Vigo plaster is applied, and changed night and morning. Vidal recommends this procedure to be repeated every eighth day, until the tumor has completely disappeared. If the treatment is abandoned before this result has been obtained the tumor begins to enlarge. In one case of keloid, Herman Lawrence, of Melbourne, obtained an encouraging result from multiple scarification followed by compression for several months; at the end of a year the seat of operation resembled thin scar tissue. Dr. W. A. Hardaway, of St. Louis, having observed benefit from electrolysis in the case of hypertrophied scars, suggested that the same method might prove advantageous in keloid. In his paper the writer related the effect produced upon a small keloid treated in this manner. The tumor disappeared, and its place was taken by a smooth white scar, and four years later had not returned. In the hands of other observers the results have been conflicting, as might naturally be anticipated where so inveterate a malady is concerned. Dr. Hardaway subsequently announced, by a similar treatment, the measurable improvement of a second case; and Dr. Morrison, of Baltimore, has obtained a good result in one case of keloid. Brocq, of Paris, has spoken favorably of the electrolytic treatment. The latter writer, in a recent communication, states that in keloid he advocates a mixed treatment. This consists in the successive employment of several measures which have been found of more or less service. Very often, less improvement will follow the later than the earlier operations by scarification. In such event he would resort to electrolysis for a time, and then revert to scarification. By thus alternating different approved or promising measures, Brocq thinks that oftentimes a signal advantage is gained. Operative measures, whether performed by the knife or caustics, are generally inappropriate, the growth almost invariably returning, sometimes even increased in size. An operation may be necessary when the tumor becomes very large or interferes with the function of the part, but, if performed, it will afford only temporary relief.

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[1] Dermatologisches Zeitschrift, Berlin, vol. x, No. 2.

Duhring states that caustic potash offers the most efficient remedy if an operation is demanded, but he further adds that the idea of employing it should not be entertained if the disease is increasing. Piffard relates a case in which incisions into the tumor, followed by applications of acetic acid, reduced the growth until it was hardly appreciable. Absorption will occasionally follow slight compression with any ordinary plaster, such as one of resin or soap. Perhaps, for the purpose of obtaining additionally the effect of medication, it would be better to use the mercuric, belladonna, or the lead plaster. Ointments of lead, mercuric oleate, and iodide of potassium are also useful. Verneuil made use of an elastic bandage. Wilson derived benefit from painting the growth with a drachm (4 gm.) of iodide of potassium and an ounce (32 gm.) each of soft soap and alcohol, followed by the constant application of lead-plaster. Collodion, iodine, or liquor plumbi subacetatis are also useful applications painted over the growth. Iodide of ammonium or lead is likewise valuable employed in the form of an ointment. Interstitial injections of a ten-per-cent. solution of thiosinamine has produced absorption of the lesions, as reported by Sinclair Tousey, of New York.

When the growth is small, Dr. Browning has seen success attend the application of a three-per-cent. solution of bichloride of mercury in collodion. The preparation is thickly spread upon the tumor, and drops off at the end of five or six days, when it may be renewed. This course is continued until the morbid mass is reduced to the level of the surrounding surface.[2]

Drs. Redard and Barret report[3] the cure of a keloid by means of the high-frequency current. A seven-year-old girl with an extensive, thickened keloid upon the arm was given 40 applications. At the end of the treatment the lesion had entirely disappeared and the skin had again assumed its normal appearance. Two small keloids in the neighborhood of the large one were also cured. At the end of a year there had been no relapse.

At the Academy of Medicine, Paris, on May 26th, 1908, M. Wickham and M. Degrais communicated a paper[4] upon the curative effects of radium in the treatment of unhealthy scars. They exhibited a number of photographs showing scars, the results of tubercolous lesions, burns, and various injuries, which had disappeared or been greatly diminished in size, and others which showed the specific kind of action which radium exercises over keloids of various forms—for instance, presternal and spontaneous keloids and those following on acne, anthrax, and scars of wounds. The authors laid stress on the painless and convenient method of application which the treatment permits and which renders it suitable for children of very tender age, and they add that some tumors disappear quietly without the necessity of securing a visible therapeutic reaction. They regard radium as having a selective curative affinity for such affections of the skin as epitheliomata, nevi, and keloids.

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[1] Shoemaker: "Materia Medica and Therapeutics," seventh edition, 1908.

[2] London Medical Recorder, June 20, 1890, p. 212.

[3] Presse Med., 1906, No. 55.

[4] The London Lancet, June 13, 1908.

**Prognosis.**—The prognosis of the disease is usually unfavorable. It may, after a time, be arrested and cease entirely to grow, and yet quiescently persist during the lifetime of the patient. This, too, may happen without interference with the general health. Upon removal of the tumor, it generally returns and attains a volume often much larger than the original growth. Spontaneous involution of the disease has been observed to occur in some cases,[1] but such are always rare.

CICATRICES.—Directions for the treatment of *cicatrices of the skin* may be appropriately introduced here. Cicatrices, as stated in the chapter on symptomatology, are new formations occupying the place of normal tissue that has been destroyed by various morbid processes. They may occur as the result of burns, scalds, or wounds, or they may follow surgical operations. In the majority of cases, however, they are the result of partial repair following ulcerative destruction, occurring in the course of various diseases. They are composed of connective and fibrous tissue, but do not contain any blood-vessels, nerves, lymphatics, or glandular structure. There are three varieties of cicatrices: one, level with the surrounding surface; a second, depressed below it; and a third, elevated above it. Cases of the first two varieties rarely require any treatment, and, as a general rule, should not be disturbed unless they become excessively painful. The last or hypertrophic variety is exposed to more or less irritation, is consequently liable to form keloid, or undergo any of the forms of malignant degeneration. It is also, when extensive, productive of great deformity. If there be sufficient cutaneous tissue surrounding the lesions of this variety, they should be removed by excision, and the edges of the wound should be carefully approximated. If this procedure be impossible, or inadvisable, an effort should be made to secure partial absorption of the tissue forming the cicatrices by repeated applications of nitrate of silver, codliver oil, or tincture of iodine. Marked improvement can be obtained by the persevering employment of gentle massage and by the frequent application of galvanism. In obstinate cases, or when a large extent of surface is involved, as after small-pox, excellent results can be obtained by painting the surface daily with flexible collodion, thus securing a gentle but uniform and continuous pressure upon the lesions.

## FIBROMA CUTIS OR FIBROMA MOLLUSCUM.

SYNONYMS.—Molluscum simplex—Molluscum pendulum.

Molluscum fibrosum, a connective-tissue new growth, is characterized by the development in the skin of firm or soft, rounded, painless, sessile, or pedunculated tumors, varying in size up to a split pea, an egg, or even larger.

**Symptoms.**—The connective-tissue tumors which constitute this disease may occur singly or in numbers, but are more commonly of multiple development. They may be so small as not to be visible, and can be detected only by passing the fingers over the skin; but, on the other hand, they may be so large as to be most prominent and perceptible. Their shape, even upon the same surface, varies greatly. They may be connected with the subcutaneous tissue by a broad base, or may hang from the skin in short pedicles. The skin covering the growths may be, and usually is, normal, but may be tense, giving the surface a pink or reddish color; or, again, may be loose, hypertrophied, or atrophied. In consistency, some of the tumors are soft—which is most usual—while others may be fibrous and hard. The lesions are generally multiple, and are present in various stages of development, and irregularly distributed over the body, with perhaps preference for the trunk. Their size as well as their shape varies considerably, most of them, however, being small, about the size of a pea, while some may be as large as a child's head. They are not attended with subjective symptoms, and, if large, occasion physical annoyance only through their bulk and weight, and mental annoyance through deformity. The tumors may occur upon any part of the body at any time of life, but they most frequently appear in childhood. After forming, they generally grow slowly, and having reached a certain size, remain constant throughout life. Sometimes, when large, by their pressure, they occasion inflammation, ulceration, and gangrene.

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[1] See report of case by Dyce Duckworth, British Medical Journal, October 8, 1881.

The number of these tumors is sometimes very great and their proportions enormous. In a man who came under the notice of Dr. Brand, (reported in the London "Lancet"), the disease, if the patient's assertion could be relied upon, was congenital. The back and buttocks were studded with a great number of growths. Though some were of moderate size, none was extremely large. E. D. Y. Pode also writes in the London "Lancet" concerning a man "covered with an innumerable quantity of small tumors ranging in size from a small orange to a pin's-head; from the thoracic wall over the lower true ribs of the right side was situated a large pendulous tumor which hung down as far as the upper third of the thigh." There was no history of any other tumor in the family. The most remarkable case on record, however, is that communicated to the Sei-I-Kwai "Medical Journal" by Tsunatsune Hashimoto, surgeon-major of the Japanese army. No less than 4,503 tumors were present. They spared no portion of the body, but were found upon the head, face, neck, front and back of the trunk, and upon both upper and lower extremities. Some of the growths were exceedingly large. Sometimes the development of a tumor originates the formation of very large and pendulous folds of skin, which hang downward like capes or aprons, forming the condition termed dermatolysis.

**Diagnosis.**—The differential diagnosis between this disease and *molluscum epitheliale* has been pointed out fully under the head of the latter. The location of the tumors beneath the skin, and absence of any depression or aperture upon their summits, ought to be all-sufficient to determine the character of the affection.

Molluscum fibrosum may also be mistaken for multiple *neuromata,* or for *lipomata.* But the pain associated with the former, and the lobulated structure and soft consistency of the latter, will prevent mistake and decide the diagnosis.

**Pathology.**—The portion of the skin in which molluscum fibrosum has its origin is said by Fagge and Hawse to be the connective-tissue walls of the hair-sac; but Rokitansky, on the contrary, asserts that it begins in the connective tissue of the corium. Virchow, Kaposi, and others hold a view dissimilar to both, and state that molluscum fibrosum has its origin in the connective tissue, around the fatty tissue. The last-named view is the one most commonly accepted. The tumors are bound down to the subcutaneous tissue by their pedicles. An incision made into one of them, exposes a white, fibrous mass enveloped in a capsule of dense connective tissue. In the peripheral portion the fibres are not so coarse as elsewhere; but have more the appearance of the corium. The central part of the tumor is soft and pulpy, and by pressure a small quantity of yellowish fluid may be made to exude from it. Young tumors are found to consist of gelatinous, newly formed connective tissue, the cells being copious, with irregular and fine fibrillæ. Old tumors, on the contrary, are made up of dense, closely packed fibrous tissue, and at times exhibit considerable vascularity about their bases.

**Etiology.**—The cause of the disease is unknown. It is more common in negroes than the white races. It has been said to be hereditary, because occasionally appearing in several successive generations. Non-hereditary cases, however, have been recorded of its development in several persons of the same family. Instances have been reported in which it followed local irritation, but many cases occur in which this cause has borne no part. Hebra found, in his observation of the disease, that persons attacked by molluscum fibrosum were invariably of weak physical and mental organization.

**Treatment.**—The tumors, if not very numerous, may be removed by excision, ligation, or cauterization. The galvano-cautery is probably one of the most successful methods of employing cauterization for their removal. The x-rays, skilfully applied, may gradually bring about absorption.

**Prognosis.**—The disease ordinarily lasts a lifetime. Spontaneous involution rarely occurs. The tumors generally increase in size and number until they reach a certain development, after which they remain fixed in size and character. As a general rule, they do not endanger life, but occasionally, through causing some constitutional derangement of the system, they produce fatal results.

## XANTHOMA.

**Synonyms.—Xanthelasma—Vitiligoidea—Xanthoma palpebrarum—Molluscum cholestérique.**

Xanthoma (from Gr. ξανθός, yellow), is a connective-tissue new growth of the corium, characterized by the development of one or more yellowish, variously shaped and sized, smooth, or slightly elevated patches or tubercles, composed of fibrous and fatty tissue.

**Symptoms.**—The disease appears in two forms, xanthoma planum and xanthoma tuberosum, or multiplex, which may be described as follows:

Xanthoma Planum consists of variously formed and sized patches situated in the corium. They are usually sharply defined, flat, smooth to the touch, the skin appearing perfectly natural. At times they are slightly raised above the surrounding skin. In color they are more or less yellowish, their tint having been compared to that of chamois-skin. In shape they are generally rounded or elongated. In size they vary from that of a pin's-head to that of a pea, or may be larger. The lesions usually begin as very small patches, and slowly increase until they attain a certain size, after which they remain at a standstill. Their most common seat is on the eyelids, particularly the upper lid. They also appear upon other portions of the face and on other parts of the body. The patches have been observed on the cornea, lips, palate, trachea, in the spleen, the lining membrane of the bile-ducts, and in the abdominal muscles. One or more patches may occur on the same or different regions, and if they approach each other may finally coalesce.

Xanthoma Tuberosum appears as papules or tubercles of varying shapes and sizes. They are generally round, and from the size of a pin's-head to that of a pea, or larger. Their color, consistency, and other characteristics do not differ much from the variety just described, except that they generally occur upon the neck, trunk, and extremities. Occasionally the lesions are slightly painful. They sometimes occur in connection with xanthoma planum.

Xanthoma is a disease of middle or advanced life, but it may occur at any age. It is more frequently encountered in women. The lesions are generally single (xanthoma solitarium) but in rare instances are multiple, invading a large part of the body, and sometimes the mucous membranes (xanthoma multiplex). As a general rule the disease begins as the macular variety, in the inner canthus of the eyelids. It usually develops gradually, runs a slow course, and lasts a lifetime. The disease may, on the other hand, as in the cases of Korach and Hertzka, develop rapidly within a few weeks, involving almost the entire body, and be complicated with icterus and pruritus. A case, remarkable on account of the dissemination of the lesions and the early age at which the disease began, has been placed on record by

Dr. George T. Jackson,[1] of New York. The patient was a boy of five years of age, whose body, with the exception of hands, feet, and scalp, was covered by a characteristic and symmetrically arranged efflorescence. The eyelids were not spared. The eruption was said to have appeared when the child was three months old, was preceded by no disease, and came out over all the body at the same time. The late Professor McCall Anderson met with an apparently congenital case in a child three years of age. The patches at times disappear spontaneously.

XANTHOMA MULTIPLEX.—Xanthoma multiplex exhibits patches of a more or less yellow tint, tubercles and nodules, both discrete and confluent in different parts of the skin and mucous membrane. The author will give a brief abstract of an interesting case[2] exhibited by him at the Fifty-fifth Annual Session of the American Medical Association, in the Section of Cutaneous Medicine, at Atlantic City, New Jersey.

*History.*—A lad, 18 years of age, afflicted with peculiar, characteristic and unusual lesions on the hands, knees, posterior aspect of the thighs below the buttocks and on the eyelids, was brought by his father to the dermatological clinic of the Medico-Chirurgical Hospital; was shown to the classes on several occasions, and made the subject of a clinical lecture.

*Physical Examination.*—Small in stature, general lack of development. Greatest weight, 79 pounds; present weight, 67 pounds. Thin, with almost no subcutaneous fat. General appearance that of a boy of twelve. Face marked with lines, giving the appearance of old age. Skin pale, showing a general anemic condition; complexion yellowish, subicteroid; tongue flabby and pallid; chest narrow, scapulæ prominent, marked depression above and below clavicle. Circulation poor; pulse weak; heart's action increased, apex beat displaced, diffuse, functional cardiac murmur. Liver enlarged, extending from fifth interspace to an inch below umbilicus. Spleen enlarged; could be easily palpated.

*Urine.*—An analysis of the urine gave the following results: Sp. Gr. 1014; acid reaction; no albumin; no sugar; no sediment; hyaline cylindroids; blood-cells, uric acid and urates in abundance.

*Blood.*—An examination of the blood by Dr. L. Napoleon Boston revealed: Red corpuscles, 3,990,000; white corpuscles, 20,000; hemoglobin, 60 to 67 per cent. Dr. Boston also contributes the following notes concerning the blood: The red cells were pale. There was marked variation in the size of the red cells, many of them being greatly oversize, while others were scarcely one-half the normal diameter. The viscosity of the blood was diminished. The red cells stained freely as a rule; cells nearly colorless were often seen. The central pale spot in the red cells was much enlarged, and at times this pallor extended to near the margin of the cell. The hemoglobin had been extracted from areas in the protoplasm, and these pale areas overlying such degeneration resembled somewhat the effect produced by the malarial parasite. No pigment was seen in the red cells. The differential leucocyte count was as follows:

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[1] Journal of Cutaneous and Genito-Urinary Diseases, July, 1890.

[2] "Xanthoma," by J. V. Shoemaker, M.D.,; read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Cutaneous Medicine and Surgery. Journal of the American Medical Association, October 13, 1906.

| | Per cent. |
|---|---|
| Polymorphonuclear cells | 66.0 |
| Large lymphocytes | 4.5 |
| Small lymphocytes | 15.4 |
| Eosinophiles | 6.0 |
| Myelocytes | 3.0 |
| Large mononuclears | 4.5 |
| Transitional cells | 0.6 |
| | 100.0 |

*Description of Lesions.*—The palmar and dorsal surfaces of both hands were covered with small growths, which had been in existence for about six months. They first came on the hands. The affected regions did not ache spontaneously, but were painful on pressure. The boy could not grasp objects firmly by reason of the tenderness of the palms. The earliest lesions occurred on the palms, especially in the flexures of the metacarpophalangeal and phalangeal joints. They were symmetrically arranged, and a description of one hand will do for both. An artist, with deliberate intent and skill, could not more accurately copy the picture from palm to palm. The palmar aspect of the thumbs and fingers were studded with discrete tubercles, most prominent in the flexures of the joints. At the base of the thumbs were numerous tubercles, which presented a linear arrangement. Lesions were similarly distributed, corresponding to the principal lines of the palms. They were also perceptible between the fingers. The disease was likewise conspicuous over the knuckles, although the lesions in these situations were less numerous and distinct than on the palms. An equal symmetry was observed in the location of the growths on the backs of the hands. Lesions were observed between the fingers, and in the flexures of the elbows they were confluent. The distribution was symmetrical on both arms. Large lesions were scattered, though more sparsely, over the back. Some of the largest tubercles, about the size of a pea, were situated below the gluteal fold. Lesions existed behind each ear and on the scalp. The upper and lower lids of both eyes were covered with numerous small lesions. They were present on the dorsal and plantar surfaces of both feet, and between the toes. Walking was impeded, and kneeling was painful. In various situations the lesions were both nodular or discrete, and confluent. Small nodules were seen on the penis. A patch existed on the mucous membrane of the mouth, corresponding to the attachment of the upper lip to the alveolar process. There was a spot of the same kind on the lower lip and others at the angles of the mouth, and one on the uvula. Several were situated within the nostril. Those located on the mucous membrane were rather more conspicuous than those on the skin, owing to the contrast between their yellow color and the red of the mucous membrane.

Many of the lesions were slightly elevated; others were plane with the surface. They were of a yellowish color and resembled fragments of chamois leather embedded in or attached to the skin. As the father expressed it, they were particularly numerous where the skin was "slack," or where it was habitually brought in contact with objects.

The lad lasted two years after his examination at the meeting. He received the most careful personal attention, especially as to the medical treatment. He frequently bled from his mouth and the different mucous outlets of the body. On the removal of a tooth, the bleeding was so persistent that he almost bled to death. He died January, 1908, from general anemia and debility. A post-mortem examination revealed an enormously enlarged liver and spleen with general anemia of all the organs and tissues of the body.

**Diagnosis.**—The lesion occurring in xanthoma is so characteristic in form, color, and situation that it can not usually be mistaken for that of any other disease. *Milium* appearing on the face may bear some resemblance to xanthoma, but the doubt can readily be resolved; for pressure will remove the contents of milium, while it will in no wise affect the lesion of xanthoma, or at best will only force out of it some bloody serum.

**Pathology.**—Xanthoma is a connective-tissue new growth, which may be followed by fatty degeneration. The most accepted view of the disease is that given by Pye-Smith, who has made a most careful investigation of it. He concludes that it is a chronic hyperplasia of the deeper layer of the cutis, in which, on the one hand, the papillæ and the epidermis, and on the other, the subcutaneous tissue, are only secondarily involved. The inflammation-cells, or young leucocytes, may be converted into new connective-tissue cells and be finally transformed into adipose tissue; or, instead of becoming so changed, they may take on fatty degeneration, resulting in a detritus of oil-drops, calcareous masses, and cholesterin crystals. The so-called "xanthoma bodies" are cells with a distinct membrane, granular or fibrillated protoplasm, and large, round, vesicular nuclei, which may be numerous (a dozen or more). These bodies are distinct from the endothelial cells and new-formed connective tissue.

**Etiology.**—Pollitzer claims that the xanthoma of the eyelids is due to slow fatty degeneration of the muscle fibres of the orbicularis; and he believes that this disease has no pathological connection with the generalized forms of xanthoma, of which the cause is unknown. In a few instances it is hereditary. Some have observed the disease in connection with affections of the liver. Jaundice has been noticed in many cases just before or during the course of the disease. The claim, however, that the affection is dependent upon a diseased liver has not been substantiated, as in many cases this organ was not affected. Xanthoma has been seen in association with diabetes and gout. In a case under Sir Jonathan Hutchinson, symmetrical patches existed upon the eyelids, and small streaks of the same disease were situated over the right olecranon process. The corresponding olecranon bursa was much enlarged, and fusiform swellings were found in connection with numerous tendons. Several periosteal outgrowths were present. The patient had inherited gout, and had been the subject of several attacks. The xanthoma of the lids had first appeared after jaundice due to severe fright. The patient's father and his father's mother had suffered from xanthoma of the lids. Török and T. C. Fox have observed its occurrence in families for three generations. This lends support to the view that the disease is due to embryonic and local causes. The lesions may be observed exceptionally in early childhood, but usually it appears during middle age or later. Women are affected more frequently than men (Hyde and Montgomery). Hutchinson,[1] in a clinical lecture delivered at the Polyclinic, in London, spoke upon the association of all forms of xanthelasma with liver disorder. Besnier states that diabetic xanthoma is apt to locate itself in the mouth and spare the eyelids. In reference to buccal xanthoma he remarks that its course is irregular, and it progresses rapidly, but often undergoes spontaneous involution. In cases dependent upon diabetes the lesions develop more rapidly than in other cases, and in one instance were present before sugar was recognized in the urine, while in a recently reported case glycosuria had entirely disappeared fifteen months before the advent of the eruption. These patients are generally obese, and of the male sex.

In diabetic xanthoma, itching, tingling, or tenderness may develop. Malcolm Morris asserts that although jaundice frequently occurs in ordinary xanthoma, it never accompanies the xanthoma of diabetics.

**Treatment.**—Wilson and Besnier both believe in constitutional treatment for the disease, and report good results from cases managed in that way. In diabetic xanthoma the treatment is largely dietetic. Recovery has followed the use of small doses of Fowler's solution (Robinson). Wilson suggests nitro-hydrochloric acid, with now and then a blue pill, and after a time arsenic. Besnier reports the rapid removal of the tubercles from the administration first of phosphorus and then of turpentine. In the majority of cases local treatment is the only way of removing the deformity. Caustics, the curette, and the knife are the only effective resort. Erasion and excision are usually practiced. Great care should be taken in excising the diseased part to so perform the operation as to prevent ectropion. Dr. Hardaway has applied electrolysis to xanthoma and secured in this way a disappearance of the lesion. Two cases are mentioned by Dr. Ernest Wende, in which the same method was used with complete success. Stern reports a favorable result from the use of a ten-per-cent. solution of mercuric chloride in collodion. Dr. Morrow had good results from a twenty-five-per-cent. salicylic acid plaster.

Dr. James C. Maguire prefers monochloracetic acid, touching only a small spot at a time, and thus gradually all the diseased areas.

**Prognosis.**—Xanthoma, beyond the disfigurement, gives rise to no discomfort. It may continue throughout life, or in very rare cases may disappear. According to Legg, its disappearance is owing to spontaneous resolution.

Hyaloma, or Colloid Degeneration of the Skin.—Wagner has referred to this disease under the title of "colloid milium," and Besnier as colloid degeneration of the skin. The disease occurs principally on the face, neck, and upper extremities. It is found in persons during middle life and old age, although Liveing reports[2] several cases in young persons, who are much exposed to the weather, especially in those who lead an outdoor life. The affection appears in the form of many small, flat, or slightly raised, rounded, and discrete growths, varying in size from that of a pin's-head to that of a split pea. Some are accompanied by small telangiectases. In color they are a light yellow, with a shining and translucent appearance. They thus seem to contain a fluid, but on examination are found to be solid or at least semi-solid in structure. Upon incision, a soft, gelatinous mass is found. The lesions are indolent and do not itch. They undergo a change by first becoming, as Liveing shows, umbilicated, whereupon they inflame, scab, and dry up, exposing a mark, but not a scar. The lesions resemble xanthoma, both from their situation and appearance, and may be a degenerative form of it. They differ from xanthoma lesions by the fact of their translucency and of the difference in their course, as described. Besnier has pointed out that the disease consists of a colloid degeneration of the connective tissue and elastic fibres of the corium, especially in the neighborhood of the sebăceous and coil glands.

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[1] British Medical Journal, April 25, 1908.

[2] "Colloid Degeneration of the Skin," by Robert Liveing. British Medical Journal, March 27, 1886.

The glands of the skin are unaffected. In some cases a spontaneous cure has happened. Brocq advises removal of the lesions by means of the sharp curette, the operation being followed by antiseptic dressings of corrosive sublimate, phenol, or iodoform. The plaster of Vigo is also recommended.

## LIPOMA.

SYNONYMS—Adipoma—Steatoma—Fatty tumor.

Lipoma is characterized by the development of circumscribed new formations composed of fatty tissue. They are usually seated in the subcutaneous connective tissue, but are more or less elevated above the surrounding surface. Their range in size is very great. Sometimes as small as a split pea when first observed, they frequently reach a diameter of several inches. Fatty tumors are soft and smooth to the touch, and more or less globular in shape. Although generally lobulated, they but seldom affect the color of the skin where they are situated, beneath which they are slightly movable. These growths vary in number from one to a hundred or more, pursue a benign course, and never become inflamed unless subjected to irritation. Lipomata are not attended with any pain, except in rare cases, when they press upon a nerve-fibre. In some cases the growths undergo fatty or calcareous degeneration. Large lipomata may become pedunculated, or may break away from their attachments by force of gravity, and move from place to place beneath the surface.

**Diagnosis.**—Fatty tumors can usually be distinguished without difficulty from all other new formations by their soft, semi-fluctuating consistency, their painless nature, normal color, and more or less lobulated character.

**Pathology.**—Lipoma consists of a variable number of large fat-cells surrounded by a capsule of connective tissue.

**Etiology.**—The etiology of these growths is not known.

**Treatment.**—Excision is the only effectual treatment, and it should be promptly resorted to in all cases where the tumors are few in number or a source of inconvenience. Parenchymatous injections of ether, or of pancreatin, may be useful in cases where operation is refused. In some instances absorption occurs after an attack of acute disease, such as typhoid fever. Rarely do they disappear spontaneously under ordinary circumstances.

In one case Dr. Joseph Schmidt, of Berlin, succeeded in curing a fatty tumor by the external application of ichthyol. A fifty-per-cent. solution was rubbed in for ten successive days. The growth was seated directly over the carotid artery. On the fourth or fifth day there was a perceptible diminution of size, and on the ninth day the tumor was greatly reduced, and began to suppurate. The pus was evacuated and the sides of the cavity drawn together by ichthyol plaster. By the twelfth day no trace of a tumor remained.

## ANGIOMA.

**Synonyms.—Nevus vascularis—Nevus sanguineus—Nevus flammeus—Gefässmal—Tâches de vin—Telangiectasis—Angio-elephantiasis—Tumor cavernosus—Fungus hematodes—Aneurysma spongiosum—Claret-stain—Port-wine stain—Mother's mark.**

Angioma (Gr. *ἀγγεῖον*, a vessel) is that pathological alteration of the skin which consists wholly or in part of permanently enlarged or newly formed blood or lymphatic vessels.

The angiomata are therefore divided into those which contain blood-vessels and those which are formed of lymphatics. The former, consisting of blood-vessels only (angioma propria), are described under the above subdivisions as nevus vascularis, telangiectasis, angio-elephantiasis, and tumor cavernosus (angioma cavernosum).

Nevus Vascularis.—Vascular nevi are new formations situated in the skin and subcutaneous connective tissue, composed mainly of blood-vessels that are either congenital or appear shortly after birth. Their form and size vary. They may be flat or slightly elevated, well- or ill-defined, distinct or faint smooth spots on the skin, which are light, bright- or dark-red, violaceous, bluish or livid in color. Nevi are round or irregular in shape, and from the size of a pin's-point, a pea or bean, to that of the palm of the hand, or large enough to embrace an entire limb or region. Sometimes they appear as uniform red patches, or have varying shades of red, being traversed by tortuous and dilated capillaries, the surface being generally or partially raised. Finally, nevi may appear as erectile, turgid, vascular, pulsating tumors, with a smooth, but more frequently a rugous, surface. They are more often observed in men than in women. Usually single, but sometimes multiple, they are most commonly seen on the head, especially the face, cheeks, lips, nose, eyelids, forehead, and scalp. They also occur upon other parts, more particularly on the upper extremities, as on the back of the hands, the trunk, the penis, and labia, the lower extremities being rarely invaded. They may appear alone, as already described, but they are occasionally associated with warty growths, and may exhibit pigmentation. They are easily compressed and deprived of their characteristic color by pressing the blood out from the parts. Their color thus becomes fainter, sometimes almost imperceptible, when the blood in the capillaries lessens during syncope, or as the result of the development of another disease. On the other hand, an accession of blood during mental excitement, after meals, and in changes of temperature, often renders them more turgid and highly colored. Their course varies. The form, size, and condition of nevi present at or after birth may remain stationary. They may retrograde or continuously increase in size, spreading superficially at one time, and at another deeply. The more vascular the more liable they are to enlarge.

Sometimes, especially in the simple flat form, the lesions of nevus disappear early in life without treatment. Occasionally inflammation and gangrene arise, either spontaneously or from external causes, which complication may produce either partial or complete involution, superficial or deep spreading of the nevi, or this may finally assume a malignant character.

TELANGIECTASIS.—Telangiectases consist of dilated and newly formed capillaries that are sometimes congenital, but as a general rule, they are acquired during adult age. They may make their appearance either as round, oval, or irregular spots, as a plexus of enlarged vessels in the skin, or in the form of tortuous, branching lines, which may vary in color from a light-red to a dark or even a blue tint. Their size varies from that of a minute point to that of a pea or a small penny, occupying a greater or lesser extent of the surface traversed by the capillaries of the part. Telangiectases may be smooth, on a plane with the surrounding skin, or be raised prominently above it, assuming a berry-like or warty appearance. They appear, as remarked, either as single or multiple ill-defined patches, or as a network of capillaries of serpentine lines. Any part of the body may be attacked by them, but usually it is the face, and chest. Generally they do not develop until adult or middle life, are unattended with any subjective sensation, and with the advance of years slowly increase in size and number. The lesions may appear in large numbers in a rare form of the disease, known as telangiectasis circumscripta universalis, of which only about twenty cases are on record. This may occur as an acute condition as in Osler's case,[1] and may be attended by hemorrhages and hematuria. In a case of multiple, hereditary, developmental telangiectases, reported by F. Parkes Weber,[1] of London, England, there was marked anemia. The blood changes were very decided. The red cells were only 2,833,000 and the white cells 11,350. The hemoglobin was 45 per cent. The blood cells were pale, and some undersized, but not otherwise abnormal. There was no myeloid reaction. The white cells were given as follows: neutrophiles (polymorphonuclears) 42 per cent; lymphocytes 45.2 per cent.; intermediates 7.2 per cent.; large hyalines 2.4 per cent.; eosinophiles 2.4 per cent. and mast cells, 0.8 per cent.

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[1] Bulletin of the Johns Hopkins Hospital, October, 1907.

A characteristic symptom in this case was recurrent attacks of epistaxis, every two or three weeks. No other hemorrhages except from the nose in the patient or her family. Of her nine children three exhibited similar angiomatous lesions and suffered with repeated epistaxis. Two of the grandchildren also had epistaxis.

W. Blegh[2] reported a case in which repeated hemorrhages occurred from a minute nevoid growth on the left forearm, and also on the face. The lesions were destroyed with the cautery and did not return. F. Parke Weber has called attention to the relationship of telangiectasis to hemorrhoids and ordinary varicose veins, which appear to be hereditary in some families, and are a form of angioma.

Telangiectases may disappear spontaneously, but usually remain permanently. Those due to injury may sometimes bleed freely, particularly when they invade mucous-membrane surfaces. The lesions frequently are congenital in their origin. The transient, or permanent, dilatation or new growth of vessels, which occurs as the result of some other disease of the skin, and which is seen sometimes in acne, rosacea, lupus, internal carcinoma and other affections, is a symptomatic telangiectasis. This also occurs in the form of spider nevi in scleroderma, and after x-ray burns. Moisay and Malloizel[3] describe certain cutaneous manifestations among the evidences of chronic lead poisoning, or saturnism. In one case, numerous telangiectases appeared, symmetrically distributed, which were attributed to the effect of the lead upon the cerebro-spinal centres. The abuse of alcohol also leads to the development of small telangiectases, especially upon the nose, cheeks and forehead. Osler has pointed out the frequent occurrence of these lesions following disease of the liver. This condition of the face in which there is marked dilatation of the capillaries is known as "rosacea."

ANGIO-ELEPHANTIASIS.—Angio-elephantiasis is a form of vascular new growth which appears as large, pendent, soft, and elastic tumors seated in the skin. These tumors, which have their distinctive color, may occupy a large portion of a limb. Taken in the hand the mass has a sponge-like feeling, being easily compressed and reduced in size, but returning to its former volume when the pressure is removed. The tumors have their origin primarily in the subcutaneous cellular tissue, which sometimes makes up the larger part of the mass. Occasionally, the vessels preponderating, the growth is principally vascular. The new connective-tissue growth therefore becomes the most active factor in the disease, and in this respect it differs from common nevi. The tumors increase rapidly in number, and by their continuous growth occasion atrophy of the muscles, nerve, and bone. Painful neuromata are sometimes developed, and they exercise a most pernicious influence on the general health.

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[1] Lancet, July 20, 1907.

[2] The Lancet, Feb. 23, 1907, p. 508.

[3] Revue de Médecine, June 10, 1907.

TUMOR CAVERNOSUS.—Angioma-cavernosum is also a form of vascular new growth, but it seldom occurs in the skin. It begins in the subcutaneous cellular tissue, in the form of nodules from the size of a small pea to that of an ordinary bean. In shape they are round or oval, covered with normal skin, and, owing to their surrounding attachments, are only slightly movable. The growth, as a general rule, occurs in single nodules, but it may be represented by many. They are most frequently met with on the upper and lower extremities, along the course of the cephalic or the saphenous vein, but also, though more rarely, on the face, neck and shoulders. The tumor increases slowly in size and gradually takes on the same appearance as the ordinary nevus, but differs very much from the latter in its anatomical structure, and is spontaneously and by pressure painful. It consists of a dense framework of connective tissue enclosing both large and small cavities, through which the blood freely circulates and communicates with some of the larger adjoining vessels. The tumor is in structure similar to the cavernous tissue of the genital organs, and is both erectile and compressible.

In a case of this character, under the care of Hildebrand, of Göttingen, the tumor first appeared when the patient was three years of age. It was situated on the ball of the left thumb, and was bluish in color. As it enlarged new tumors developed on the forearm, arm, shoulder, and neck. All occupied the flexor side of the arm. Three were connected with large subcutaneous veins. Though not in direct relation with the main blood-vessels, they were freely supplied by small arteries. All had originated in connective tissue, but that of the thumb had involved muscles and skin. The septa were furnished with blood-vessels, the meshes contained blood, and in some instances phleboliths. Each tumor lay between an artery and a vein. The artery expanded so that its outer wall became the capsule of the tumor and its inner wall the septa.[1]

**Diagnosis.**—There should be no difficulty in recognizing the angiomata just described, the variously shaped, flat, red patches, or net-work of capillaries, which persist and are painless, or the prominent dark-red or blue erectile tumors, both of which are sufficiently expressive.

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[1] New York Medical Journal, March 8, 1890.

**Pathology.**—*Nevi,* which are generally situated on the upper part of the corium and the subcutaneous connective tissue, consist of both arteries and veins, some of which are of new formation. The dilated and hypertrophied vessels are also included in more or less connective-tissue new growth—a feature scarcely perceptible in telangiectasis. Hair-follicles, sebaceous and sweat glands, are also sometimes present in nevi, which, as has already been stated, may become verrucose or pigmented. The flat or simple angioma, nevus flammeus, consists mainly of dilated and deformed capillaries situated in the upper layers of the true skin. In the nevus proper, or lobular angioma, there is more or less connective tissue between the convoluted blood-vessels, which are inordinately numerous in angio-elephantiasis. The cavernous angiomata, as has already been shown, are made up of connective tissue in structure like the ordinary erectile tissue of the corpora cavernosa. The color of the nevus depends upon whether arteries or veins predominate in it, and also upon the superficial or deep situation of the growth. Stangl, in discussing the histological features of angioma, and trying to decide whether the tumors are of epithelial or connective tissue extraction, declares that they may be rightly named "perithelial tumors." Occurring in the region of the face and neck where the bronchial clefts appear, Virchow has mentioned "angioma fissuraux."

**Etiology.**—The cause of the different kinds of angiomata just described is obscure, and this is particularly true with relation to angio-elephantiasis and tumor cavernosus. Nevi, according to my own opinion, are, notwithstanding the contrary view held by some writers, sometimes directly traceable to an impression made upon the mother during pregnancy. I recall an instance, some years ago, that came under the observation of the late Professor William H. Pancoast and myself, the history of which was as follows: We were about to operate for varicocele on a young man, and his sister-in-law, who was in the fifth month of pregnancy, insisted on having the process of the operation explained to her. This Dr. Pancoast proceeded to do, taking from his case, a large round plate and carefully explaining the details of the operation. We were both present some months later at the birth of the child of which the sister-in-law was at that time pregnant, and, to our astonishment, there was on the scrotum of the infant a well-marked nevus, having all the appearance of the round plate shown and described to the mother. In another instance I happened, a few years ago, to explain to a woman in my waiting-room an unavoidable detention, saying that I had been engaged in removing a large wart from a patient's face. She made several inquiries as to the suffering caused, and as to the probable result of the operation. I never thought of her pregnancy, and was surprised, on the birth of her child, to observe a small nevus on the right cheek, which recalled the scene in my office. Similar statements have occasionally been made to me by physicians, showing that nevi may sometimes be due to an impression made upon the mother during pregnancy, and that the belief in that causation is not unscientific, as has been stated by some writers upon the subject, but is well founded. Telangiectases may, like all the other angiomata, sometimes arise from an obscure cause, but they can occasionally be traced to a direct injury of the part, or to some obstruction in the circulation arising from a local disease.

**Treatment.**—Angiomata increase rapidly in size, occasion deformity, or give rise to inconvenience, requiring treatment when situated on exposed parts of the body. If, on the contrary, these conditions are absent, it is far better to postpone all active treatment as long as possible, as the disease may possibly undergo spontaneous involution, particularly in young children. In case it be considered best to undertake the treatment of the growth, several methods may be resorted to for the purpose of removing the deformity by rendering the skin more normal in appearance. This object can be accomplished either by destroying the new growth, or obliterating the continuity of the abnormal capillary vessels, thus interfering with the supply of blood. In attempting to secure this end, great care should always be exercised to employ such methods as will not leave a cicatrix more unsightly than the original disease. The application of special drugs has been recommended as effective with certain nevi, while as to all varieties one or another of the many surgical methods may be employed. In treating the growth by medicaments, the application of a mixture of one drachm (4 gm.) of collodium to eight grains (0.5 gm.) of corrosive sublimate is sometimes used with success. A. Frattini[1] reported thirty cases treated by the method introduced by Monteggia in 1887. A six-per-cent. solution of corrosive sublimate, in flexible collodion, is painted over the nevus and slightly over the surrounding skin. The application is to be repeated every third day, until the eschar is separated. The raw surface then is covered with an antiseptic dressing. Neumann recommended a combination employed by Zeissl, of tartar emetic eighteen grains (1.08 gm.) with two drachms (8 gm.) of adhesive plaster, to be used in the case of small, flat nevi, or of those only slightly elevated above the level of the skin, especially when situated on the scalp. There is little pain attending this application, but there is free suppuration, succeeded by a white, soft, and thin scar. Friction with croton oil and other counter-irritants is sometimes attended with good results. Success is said by Dieffenbach[2] to follow the use of a compress of lint saturated with liquor plumbi diacetatis, or with a solution of alum. Bligh[3] reports good results from painting the nevus daily with the former preparation. According to Beatty[4] and Blair,[5] nevus can be treated successfully by local applications of liquor acidi arsenici. Nevi of moderate size may be destroyed by employing some one of the caustic drugs. Thus nitric, sulphuric, or glacial acetic acid, or caustic potash, nitrate of silver, or sodium ethylate, recommended by Richardson,[1] and numerous other caustics, may be employed for this purpose. Sodium ethylate should be prepared for use by adding metallic sodium to absolute alcohol, special precaution always being necessary regarding the latter, for, if it contains water, caustic soda and not pure sodium ethylate is formed. It is of advantage in applying the sodium ethylate, which can be placed on the part with a glass rod, first to denude the surface so that the drug will penetrate better. A dense black crust follows the application, which ought to be repeated once every two or three days, until the growth is decidedly affected, when it should be allowed to slough off spontaneously. At Unna's clinic, an extra strong (30-volume) solution of hydrogen dioxide is applied, a single drop on a glass rod, twice daily, to vascular nevi. Cohn reports three cases cured by this method. It is painless and can be carried out by mothers with safety. The solution is allowed to dry on the skin. The cure is attained in three or four weeks. The injection into nevi of liquefied phenol, tincture of chloride of iron, the fluid extract of ergot, and similar drugs, as practiced at one time, is objectionable, owing to the inflammation, suppuration, sloughing, and hemorrhage, with deformity, that may follow. When the nevus is elevated above the general level of the skin, Dr. Holgate, of Bellevue Hospital, New York, recommends[2] encircling the tumor with a metallic ring in order to obstruct the circulation, and injecting from five to ten minims of ninety-five-per-cent. alcohol into the growth.

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[1] Gaz. degli Ospedali, July 19, 1903.

[2] Wilson on "Diseases of the Skin," 1852.

[3] British Medical Journal, September 25, 1880.

[4] British Medical Journal, November 24, 1883.

[5] *Ibid.*, April 19, 1884.

The destruction of nevi, however, by some one of the surgical means, is, no doubt, the safest, surest, and most effective of all methods. If the nevus or telangiectasis is small and flat, it may be destroyed by puncturing the spot with an ordinary knife or needle, either alone or dipped in one of the mineral acids, iodine, or croton oil. The same object may be accomplished by puncturing the growth with a red-hot needle. Electrolysis is one of the most appropriate of all methods now employed. Although painful, the operation is rapidly performed, is free from hemorrhage and all other untoward effects, the scarring being comparatively slight and the result generally very successful. The operation is performed as follows: One or more steel, platinum, or irido-platinum needles are connected with the cathode pole of the battery, and, if the nevus be large, one needle or a charcoal point with the anode pole; both poles are introduced at the same time into the growth. The needles are allowed to remain in the tissue for a few moments, until gas-bubbles ascend through the orifice, a clot forms, and the spot assumes a bluish-white color. The cathode needle is first removed. The current being reversed, what was the anode pole now becomes the cathode pole, which in turn can be easily removed. Without reversal of the current, the latter needle would need some force to withdraw it from the parts. The anode or the cathode needle alone may be thrust into the nevus. The action of either produces coagulation of the surrounding albuminous fluid. The cathode needle, however, it should be explained, produces a better effect in the destruction of the tissue than does the anode, but the employment of the two needles in the manner just described is much preferable to that of either singly. Repetition of the operation once every three or four days may, in the course of several weeks, result favorably. Sloughing, suppuration, and other unpleasant effects may, according to Fox, follow the use of electrolysis, but these may generally be avoided if the application is carefully and judiciously made. Cauterization, with either the actual or galvanic or Paquelin's cautery, is a most excellent operative means that is always reliable and effective. In treating nevi in this way, the degree of heat should be graduated according as the growth is superficial or deep, the former requiring a degree of heat only just sufficient to make an impression upon the tissues, while the latter necessitates a white heat in order to reach the deeper structures. Dawson states that the galvano-cautery produces a clot that becomes rapidly organized. Whatever form of cautery be selected, it is much safer to treat only a part of the nevus at a time, particularly if it be large, and thus to avoid any undue inflammatory action from the application. Vaccination is a practice from which most successful results sometimes follow.

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[1] Lancet, November 9, 1878.

[2] Archives of Pediatrics, June, 1889.

Radium has likewise been successfully employed in treating vascular nevi. Fournier has been investigating the claims of Wickham and Degrais[1] in regard to the complete cure of vascular nevi under the action of radium, and has found that their claims are substantiated. He says that the cure of extensive nevi without a trace of disfiguring scars renders the method destined to supplant all other technics when the cosmetic result is of importance, while its simplicity commends it for general adoption. The radium salt is mixed with a varnish and spread on a disc which is applied directly to the nevus. The thickness of the varnish filter and the length of the application are varied for the individual cases. A slight ulcerative reaction seems to be required for flat, superficial nevi, while deeper ones require stronger action. Prominent, projecting nevi are best treated by frequently repeated, weak doses, which act without inducing appreciable reaction. There is no destruction of tissue, to leave a defect, but the tissues are modified, and repair proceeds normally, leaving a smooth, regular surface, somewhat paler than the surrounding tissue, but otherwise normal. The application of the radium is entirely painless; the disc can be worn during sleep.

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[1] "Successful Treatment of Vascular Nevi with Radium;" L. Wickham, Degrais and Fournier; January 28, 1908, lxxii, No. 4, pp. 109-128. Bulletin de l'Académie de Médecine, Paris.

Ragaine, Paul, and others have reported most satisfactory results from the method of treating erectile nevi by vaccination. In performing the operation it is better to use the bone vaccinator, or else an ordinary strong, thick needle, as the cuts from lancing are followed by considerable hemorrhage, which washes away the vaccine matter. The surface or circumference of the nevus, or both, may be thoroughly scarified or punctured with the previously charged vaccinator-needle, the punctures being about half an inch apart, and the needle allowed to remain in the tissue a few moments to avoid too free flow of blood. The flowing blood and serum should be lightly mopped from the parts at the conclusion of the operation and the surface freely covered with more vaccine matter. Vaccination that passes through its usual course may be followed by the destruction of all or a portion of the growth, and in the event of the destruction of only a part, the same process should be again repeated for its entire removal.

A silk or wire seton passed through or into the tumor often obliterates the growth by setting up inflammation. Tilbury Fox treated in this way venous nevi, by passing silk threads through various parts of the mass and allowing them to remain until some slight inflammation was developed. On the removal of the threads, the growth was sometimes found to have been obliterated by inflammation. Excision and ligation are operative means that are often to be preferred, both for small and large nevi, and particularly for angio-elephantiasis and tumor cavernosus. The ligature as well as the pins, if used, should be passed through the base of the growth and firmly secured to avoid hemorrhage; and it is best, in the event that the tumor is large, to operate at first only on a portion of the growth, for the inflammation thus excited may possibly extend to the remaining part and accomplish the desired result. Incision with certain instruments devised for the removal of nevi has been highly recommended by some physicians. Squire claims good results from linear scarification, made with a knife having many parallel blades. The parts, which are previously frozen, are cut in an oblique manner, the incisions being repeated in the opposite direction in the course of a week, and the same process being continued until the growth has disappeared. Sherwell uses for a similar purpose an instrument having a number of needles arranged in bundles, the points being about one-sixteenth of an inch apart. The needles can be charged with strong phenol, or with a twenty-five- or a fifty-per-cent. solution of chromic acid. The instrument is firmly pressed against the nevus, and by means of a spring is made to penetrate to the required depth. On the cessation of the bleeding, which may be arrested by pressure, the surface is washed with alcohol, and several applications of collodion are made to it.

Piffard employs a most admirable instrument, consisting of a bundle of wire hypodermic-syringe points firmly embedded in metal, which instrument is especially advantageous for carrying the medicated substance used beneath the surface.

**Prognosis.**—A positive prognosis can not be given at once, or for some time after birth, regarding the course of nevi. As a general rule, a more favorable opinion can be given in the case of the simple flat nevus than in that of the erectile form. In both nevi and telangiectases it is better to watch their course and observe if their tendency be to remain stationary or to increase in size. The telangiectases seldom undergo any change, but nevi may during the first year of life retrocede and finally disappear, leaving a white scar. Nevi may, on the other hand, increase in size either in infancy or at any period of life, invading the adjacent parts, producing degeneration and atrophy. They may not only be objectionable as deformities, but may, owing to being injured, sometimes bring about dangerous hemorrhage. Unless angioma occasion inconvenience in either of the above events, or through neuralgia, as in the tumor cavernosus, or are found to be rapidly spreading, they should not be interfered with. The angio-elephantiasis frequently returns on removal, but the tumor cavernosus can be excised without much apprehension of any recurrence. Rarely, malignant changes are observed, as in the case reported by Ralph A. Campbell,[1] Chicago, which was cured by excision, and skin grafting.

## LYMPHANGIOMA.

SYNONYMS.—Lymphangioma tuberosum multiplex (Kaposi)—Nevus cystepitheliomatosus disseminatus—Lymphangiectodes—Lymphatic warts.

This is an exceedingly rare affection, which was first described by Hebra and Kaposi. Cases have also been observed by Pospolow, Van Harlingen, and Graham. It is characterized by the occurrence of a variable number of semi-transparent, reddish-brown, flat papules or tubercles. They are round or oval in shape, smooth and elastic to the touch, and are slightly elevated above the surrounding surface. When pressed, they become pale and sink beneath the surface. The lesions may be single, but are usually multiple. Hundreds were present in the case reported by Kaposi. They are slightly sensitive to the touch, but not painful. The tumors vary in size from a pin-head to that of a walnut. In Van Harlingen's case some of the lesions were like the tumors of molluscum fibrosum, while others were so compressible as to feel like distended bladders. Lymphangiomata are usually congenital, or appear in early childhood, slowly increase in size, but do not become malignant.

Under the title of pernicious lymphoderma, Kaposi in 1885 described a case which had at first been taken for a combination of universal eczema and leukemia. Irregularly localized scaly and weeping patches first appear, which itch intensely and subsequently become thickened and doughy. The spleen and lymphatic glands finally swell, leukemia develops, and the case terminates in death. Two instances of this rare disease, received in the Klinic Kahler, of Vienna, have been reported by Dr. Isidor M. Koch, of Philadelphia.

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[1] Journal of the American Medical Association, Jan. 15, 1907.

**Diagnosis.**—Lymphangioma may present a resemblance to the large papular syphilide, but the semi-transparency, the compressibility, the congenital character, and the permanency of the lesions of the former affection are so characteristic that they can not be mistaken. Dr. Pilcher met with a case of lymphangioma of the groin, presenting a close resemblance to an irreducible hernia.

**Pathology.**—The tumors of lymphangioma are seated principally in the corium, and consist of enormously dilated and hypertrophied lymphatic vessels surrounded by a network of connective tissue.

**Etiology.**—The cause of this rare affection is unknown. Dilatation of lymphatic vessels, forming varices or cysts, have occasionally occurred in consequence of repeated attacks of erysipelas. Hanot has observed two cases in which cutaneous lymphatic varices coexisted with cirrhosis of the liver and ascites.

**Treatment.**—These growths may be removed by excision or cauterization, but as the cicatrices from either procedure are even more unsightly than the original lesions, non-interference is the best plan.

**Prognosis.**—The lesions of lymphangioma pursue a benign course. The pernicious form of lymphoderma always ends fatally.

## NEUROMA.

Neuroma is characterized by the development of a variable number of neuromatous growths in the corium.

**Symptoms.**—Neuroma of the skin is a rare disease. It may appear at any period of life, but the majority of the few cases which have been recorded occurred in persons of middle or old age. Neuroma is characterized by the appearance of one or more small, firm papules or tubercles, which vary in size from that of a split pea to that of a bean. The growths are firm and slightly movable, and are at first either painless or painful, slowly increase in size, and gradually become hard and immovable. They are seated in the corium extending into the subcutaneous connective tissue, and project above the surrounding surface. Other papules or tubercles appear in the vicinity of the original lesions and pursue a similar course. The skin between and over the lesions becomes infiltrated, scaly, and more or less discolored. After a time pain becomes a distressing accompaniment of the disease. In the case observed by Dr. Duhring the pain was of a paroxysmal character, but did not manifest itself until three years after the tubercles had developed. The paroxysms usually lasted for an hour or longer, and followed exposure to cold or damp air. They were also frequently produced by movement of the affected arm or by worry. The disease did not interfere with the nutrition of the arm, and the patient's general health was good.

**Diagnosis.**—Neuroma of the skin may present a striking similarity to carcinomatous or sarcomatous formations in the corium and subcutaneous connective tissue. The pain in neuroma, however, is paroxysmal in character, while in the malignant affections it is continuous. In doubtful cases an exact diagnosis can be made by excising one of the growths and subjecting it to a microscopical examination.

**Pathology.**—The neuromatous growths are composed of more or less hypertrophied non-medullated nerve-fibres, surrounded by connective tissue.

**Etiology.**—The etiology of this affection is unknown.

**Treatment.**—If there are only a few growths, they should be excised as soon as possible; but if numerous, the treatment that offers the best results consists in the exsection of a portion of the principal nerve supplying that part of the body upon which the lesions are developed. In Kosinski's case they occupied the outer and posterior sides of the right thigh and part of the buttocks, and were intensely painful when subjected to pressure. After various forms of treatment had been employed without relief, the small sciatic nerve was cut down upon and one inch of it exsected. After the operation the pain diminished and finally disappeared. The lesions also became much reduced in size. In Duhring's case, nerve exsection was also employed with temporary relief.

NEURO-FIBROMA.—Recklinghausen's disease is described as a generalized form of neuro-fibroma, which is attended by areas of pigmentation of the skin, resembling Addison's disease. In fact, it has been regarded as neuro-fibroma *plus* fibromatous degeneration of the sympathetic nerve-elements and suprarenal capsules. Incomplete forms have been observed in which derma-fibrosus takes the place of neuro-fibroma. These have been found particularly among degenerates, and individuals suffering with hereditary or acquired taints. They have been found associated with tuberculosis, especially in spinal caries. M. Pie[1] suggests that all the lesions upon the skin occurring in the syndrome of Recklinghausen are, in reality, due to tuberculosis, either inherited or acquired.

## MYOMA.

Myoma is a rare affection, characterized by the formation in the skin and subcutaneous connective tissue of one or more new growths composed of smooth muscular fibres. They are round or oval in form, and vary in color from pale red to yellow or dark brown. The tumors are smooth and elastic to the touch, and are elevated above the surrounding surface. They range in size from a split pea to a small orange, and vary greatly in number. In some cases only a single tumor is present; in others there may be thirty or forty. Lukasiewicz has reported the case of a man upon whose thigh and leg about ninety of these tumors were present. They are usually painless, but when a nerve-filament is pressed upon, or surrounded by the fibres which compose the tumor, pain of varying intensity and duration is observed. The lesions of myoma may be limited to a single region of the surface, or may be disseminated over the entire body. Myomata arise without any apparent cause, and after attaining a variable size remain stationary for an indefinite period. These invariably pursue a benign course unless injured or irritated, when they may become inflamed and painful.

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[1] Lyon Médical, Oct. 6, 1907.

**Diagnosis.**—Myomata can be distinguished from the lesions of neuroma, sarcoma, and carcinoma by their slow growth and by the absence of pain and constitutional symptoms. They can not, however, be so readily distinguished from the lesions of molluscum fibrosum and other benign growths.

**Pathology.**—Myomata are due to proliferation or hyperplasia of the normal muscular elements of the skin, and consist, as remarked, principally of smooth muscular fibres. They may, however, be largely composed of connective tissue, and may then be properly termed fibro-myomata. A rare form of tumors, consisting of a coil of small blood-vessels surrounded by a network of muscular tissue, has been described by Virchow under the name of myoma telangiectoides.

**Treatment.**—If the tumors become painful, or if they are so situated as to produce disfigurement or inconvenience, they should be removed by excision or destroyed by cauterization.

AINHUM is an affection limited to the colored races. It was first systematically described by Silva Lima, of Bahia, though Dr. Clarke had reported to the Epidemiological Society of London in 1860 its existence among the natives of the Gold Coast. The name of the disease is said to be of African origin, and to signify to cut off or amputate. Cases have been reported by Drs. Hornaday and Pittmann, of North Carolina, and Duhring,[1] of Philadelphia. The disease is characterized at first by a constriction of the skin at the base of one or more of the toes. As the process continues constriction becomes more marked, gradually forms a furrow that completely encircles the toe and slowly increases in depth, producing obliteration of the vessels and spontaneous amputation. The little toe is usually first affected, but any or all of the toes may be involved. The progress is very slow, requiring years for its completion. It is said to be frequent on the west coast of Africa and in various parts of South America.

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[1] American Journal of the Medical Sciences, January, 1884.

Ainhum is met with in Asia, but rarely in the United States. The cause has not been ascertained. Some believe it to be neurotic in origin. According to De Brun, who has lately made a study of this disease, all the symptoms may be explained by assuming a neuritis of the lower extremity, possibly of traumatic origin.

It has been suggested that the malady may be due to mechanical interference with the circulation, similar to the constriction caused by the application of a ligature at intervals during a protracted period. The mutilation has led some to suspect that the disease is allied to leprosy. Prior to separation the toe may be swollen to twice its normal size and twisted on its axis, as in a case described by Todd. The skin covering the constriction may or may not ulcerate. Dr. Todd found that the tissue below the constriction had become very thin, and that the enlargement of the toe was due to an excessive production of adipose tissue. The nail of the affected toe usually remains intact, but may become deformed, atrophied, or entirely disappear. As the disease progresses the phalanx is replaced by fibrous tissue, the toe becomes mobile and painful, ulcerates, and is at length cast off, after which cicatrization is rapid. Ainhum is much more common in men. It is sometimes hereditary, and would seem, in some cases, to be congenital. The disease has been compared by certain writers to the mutilating form of scleroderma. According to the investigations of the pathology the epidermis is considerably thickened and the papillary layer greatly amplified. The coats of the arteries are hypertrophied and their calibre decreased. There may be profound alteration of the nails and hypertrophy of the hairs. The local temperature may be lowered or heightened and symptoms of asphyxia of the lower extremities may occur. There may be hyperidrosis of the affected limb. Sensibility to heat and pain is reduced and the reflexes are abolished.

No study has been made of the nerves of the affected digit. The fibrous tissue gradually occupies the entire space between the surface and the bone, and periosteum, tendons, and subcutaneous connective tissue are blended into one mass. The bone is atrophied and transformed into fibrous tissue. There is marked proliferation of yellow elastic tissue in the fibrous band of constriction. Perpendicular division of the stricture may, according to da Silva Lima, retard or check the progress, provided this be done in the beginning. Otherwise the member must be amputated.

## MYCOSIS FUNGOIDES.

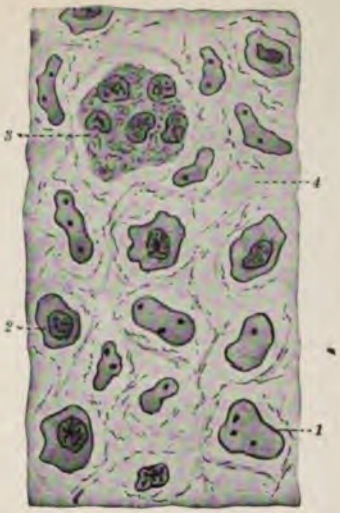
**Synonyms.—Inflammatory fungoid neoplasm—Multiple sarcoma cutis—Lymphadénie cutanée—Granuloma fungoides—Sarcomatosis generalis—Dermatosis of Alibert.**

Mycosis fungoides is a chronic, progressive skin affection, characterized by the formation of fungous tumors and having a fatal termination.

**Symptoms.**—The first manifestation, or stage, of the disease occurs on any part of the body in the form of patches having the appearance of

# PLATE XXVI

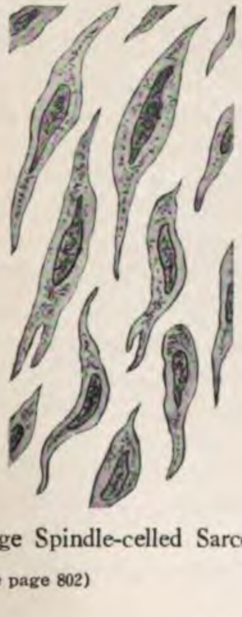
*A*



Mycosis Fungoides.

*1*, Connective tissue nuclei.
*2*, Crenated cells.
*3*, Chorioplaque.
*4*, Collagen and cellular debris.

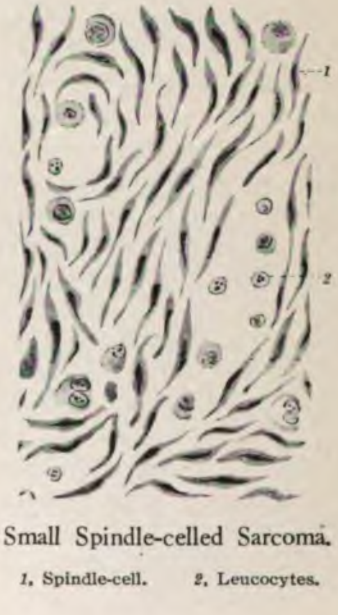
*B*



Large Spindle-celled Sarcoma.

(See page 802)

*C*



Small Spindle-celled Sarcoma.

*1*, Spindle-cell. *2*, Leucocytes.

erythema, eczema, psoriasis, or urticaria. These lesions exist without change for a period varying from a few months to a few years. In the second stage the lesions are more raised above the surface, are of a deep red color, and have a glistening aspect. Papules as large as a pea develop. Some of these disappear for a time and then recur; some vanish from one region while fresh ones present themselves upon other parts of the body. This process also may continue for months or years. The lesions give rise to much itching and pain. At length well-marked tumors begin to form, at first upon the trunk, subsequently extending to the extremities. The tumors may arise from the coalescence of adjacent papules, or they may be of entirely new formation. They are hemispherical, oval, or irregular in shape; are sometimes pedunculated, bright or dark red in color, either hard or soft to the touch. Large patches of infiltration may also be present at this stage. The overlying skin is thin and of a glistening appearance. Tumors may be seen in different phases of evolution or retrogression. Some are removed by absorption while others ulcerate and form a fungous mass. As the disease progresses the tumors develop upon all portions of the body, and may involve mucous membranes. They have been found upon the palate, tongue, and larynx. The pain and itching generally diminish during the tumor stage. As the disease advances there occurs painless enlargement of lymphatic glands.

The general health may remain unaffected for a long time. Finally a condition of marasmus is produced and the patient perishes from diarrhea, pulmonary complications, or septic manifestations.

Mycosis fungoides fortunately is a rare disease, and it almost invariably ends fatally.

**Diagnosis.**—In the early stage mycosis fungoides simulates several affections for which it may be mistaken. The sharply defined limit of its patches may distinguish it from the common forms of erythema. The persistence of the lesions may serve to differentiate them from eczema. Although certain of the manifestation bears a resemblance to psoriasis their unusual location and unusual chronicity may be sufficient to establish the diagnosis. The evolution, retrocession, and fungous aspect of the tumors point to mycosis fungoides, although the new growths may be confounded with sarcoma. In the latter disease the lymphatic glands are not involved, and the neoplasms are seldom absorbed.

**Pathology.**—Sclerosis of the spleen, miliary nodules in the liver, and a small round cell infiltration between the uriniferous tubules of the kidneys were found by Hallopeau and Jeanselme. A marked reduction in the proportion of white blood-corpuscles has been observed in one case; in others they have been increased. Unna describes a progressive growth of connective-tissue cells infiltrating the papillary layer, dilatation of the blood and lymphatic vessels, with, in the later stages, hyaline degeneration; he has also observed proliferation and edema of the epithelium.

## LOCAL ANESTHESIA.

Anesthesia of the skin as a primary affection, if it exists as a primary disease, which is doubtful, is certainly rare. It is usually a symptom of some other disease, such as leprosy, syphilis or hysteria. It may also result from wounds or other injuries, such as from exposure to heat or cold, or the toxic action of certain drugs. Anesthesia may be associated with a diminished or a complete loss of sensibility, and be either accompanied or unaccompanied with structural change in the skin. Anesthesia may, like hyperesthesia, be idiopathic or symptomatic, local or general, circumscribed or diffused, unilateral or bilateral.

The determination of the treatment and prognosis for anesthesia must, like that for hyperesthesia, depend upon the disease in which it originated.

Analgesia, or loss of sensibility to pain, is but a variety of this disease.

## DERMATALGIA.

SYNONYMS.—Dermalgia—Nervenschmerz der haut—Neuralgia of the skin—Rheumatism of the skin.

Dermatalgia is a nervous disease characterized by pain limited to the skin, with or without hyperesthesia and anesthesia of the part.

**Symptoms.**—Dermatalgia, or pain in the skin, is generally accompanied with a certain degree of sensitiveness of the surface. Occasionally, the sensitiveness that accompanies the pain may be succeeded by more or less anesthesia of the part. The pain may be of a boring, shooting, pricking, or burning character, slight or severe, constant or intermittent. The sensitiveness of the surface may be so exalted as not to admit of contact of the person with the clothing or any other material, or even with the air, without inducing the severest suffering. Again, the sensation may be that of numbness or cold. Yet, although gentle manipulation, motion, and slight contact excite pain, hard pressure often affords relief. The skin, in the majority of cases, does not present any visible change, but occasionally some lesions appear on the affected part. Erythema, urticaria, and other eruptions, have been noticed to develop during the course of the disease.

Dermatalgia is generally symptomatic, and occasionally, though rarely, idiopathic. It usually appears suddenly, affecting a small area, but may involve the general surface. Dermatalgia occurs oftener in women than in men, and more frequently on hairy than on smooth parts of the skin. The subjective symptoms, being generally more severe at night than by day, may interfere with the patient's rest.

**Diagnosis.**—Dermatalgia is sometimes confounded with neuralgia of the nerve-trunks, or muscular rheumatism, but the pain in these affections is more deeply situated as well as more extensively distributed than in dermatalgia. The differential diagnosis is shown by comparison:

**Etiology.**—Most cases have occurred in women over thirty years of age. Various organisms have been detected in the tumors, but none has as yet been demonstrated to be the exciting cause of the disease. It is, however, generally believed to be of bacterial origin.

**Treatment.**—A nutritious diet and tonic remedies are indicated, especially in the more advanced stages. Itching may be relieved by the application of phenol, creosote, menthol, salicylated camphor, and other anti-pruritic remedies in proper dilution. Pain may require the use of morphine. Arsenic hypodermically was found of service in one case by Köbner. Locally, ichthyol, pyrogallol, resorcinol, camphorated naphthol, and injections of phenol have been used. The ulcers may be treated by means of iodoform, acetanilid, iodol, europhen, thymol iodide, bismuth subiodide, naphthol, naphthalin, camphorated naphthol, salicylated camphor, or other of the numerous antiseptic agents which are useful in ulcers due to other causes. Hyde and Montgomery[1] have reported the apparently successful treatment of a case in the prefungoid stage by radio-therapy.

**Prognosis.**—Mycosis fungoides pursues a protracted course, which is progressive, and usually causes death by exhaustion, after a number of years' duration. One case has been reported as being cured by an attack of erysipelas. The unfavorable course of this disease may be arrested and an apparent cure obtained in some cases by radio-therapy, when skilfully and persistently employed.

## CLASS VIII.

## NEUROSES.

(*Neuroses.*)

### HYPERESTHESIA.

HYPERESTHESIA is an exalted sensibility of the skin, unaccompanied by structural changes. It occurs mostly as a symptom of either some functional or organic disease of the nervous system. Hysteria is the most common cause, but it occasionally follows brain and spinal disease. Hyperesthesia may in rare cases be idiopathic, but is usually symptomatic. The affection may be local or general, circumscribed or diffused, unilateral or bilateral. In typical cases, the skin becomes abnormally sensitive to the contact of the clothing or other objects, and even to that of the air. Hyperalgesia, or excessive sensibility to pain, is but a variety of hyperesthesia. Hyperesthesia may be temporary or permanent. The treatment should be the same as that for the disease of which it is a manifestation.

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[1] Medicine, Dec., 1903.

part of the treatment is the correct diet. The use of meats and rich, fatty foods is injurious and they must be avoided. The use of coffee and tea must also be discontinued. The patient should eat no meat of any kind. The diet must consist of milk and animal broth, also well-cooked vegetables, such as spinach, asparagus, baked or boiled potatoes, stewed onions, and stewed fruits of all kinds. Frequent warm salt-water baths, to assist elimination, will be of benefit. The patient must also take daily exercise in the open air; but must avoid getting wet or getting cold, which so often brings on an attack of pain. The static current of electricity will be of service to lessen the pain and stimulate circulation in the skin. The galvanic current moderately used has proved satisfactory. Salicylic acid ionization may afford relief in rheumatic cases. Verny reports a case in which a two-per-cent. solution applied on the cathode pole with a current of 10 milliampères, for one hour daily, cured an obstinate case of facial neuralgia after three weeks' treatment. The pain was relieved by the first application. Sometimes the application of a blister to the surface will be found useful. The disease is subject to relapses, and may continue obstinate for some time.

## PARESTHESIA.

SYNONYMS.—Pruritus—Itching of the skin.

Paresthesia, a form of perverted sensation of the skin, manifests itself by either an itching or a tingling, burning, creeping, or pricking sensation in the parts.

**Symptoms.**—It will be seen that the affection known as paresthesia includes a number of abnormal sensations that are usually described and spoken of as pruritus, which literally means an itching of the skin and muco-cutaneous outlets. The substitution of the term paresthesia conveys an idea of the disease under consideration, while the use of the term pruritus refers merely to one, not necessarily to all, of the symptoms, for others may be present. Paresthesia is a distinct affection, not to be confounded with prurigo, or with any other of the diseases with which abnormal sensations of the skin are associated. The first and only subjective symptom may be the sensation of either itching, pricking, or boring. In other cases any number of diverse sensations may be simultaneously experienced. Primary objective symptoms are absent, and the physician must rely entirely upon the patient's description for a proper understanding of the case. In the effort to obtain relief by rubbing or scratching the parts, secondary alterations of the skin are often produced.

Secondary lesions may or may not be present, depending upon whether or not irritation has been set up by the effort of the sufferer to obtain relief by scratching, rubbing, punching, or pounding the integument. Abnormal sensations usually vary, according to the portion of the body implicated and their exciting cause. In some instances there may be an itching, tingling, or pricking experienced, with an intense desire to scratch and tear the skin; in others, a boring or gnawing may constitute the peculiarity of the sensation. At times the sensation resembles that produced by minute insects crawling on and through the integument, and so vivid that patients often insist that worms in the skin are trying to escape or are wriggling around in the skin. Again, the sensation may suggest that a fly or insect had suddenly alighted upon the skin, prompting the impulse to brush it away. On the other hand, many patients feel as if flannel or some rough or furry substance was in contact with the body. In fact, the abnormal sensations experienced by these unfortunates are innumerable. Any case may present one or more of the symptoms enumerated, and the person, not being able to resist the intense desire to scratch, tear, rub, or pound the skin, may bring about marked secondary changes of the parts. The integument in such persons is usually erythematous, roughened, with here and there abrasions, lymph-papules, and superficial linear wounds showing the track of the nails. This condition may be present to either a slight or marked degree, and often exists, especially when severe eczema or dermatitis is a complication from the secondary changes. The symptoms mentioned may be either intermittent or constant, the former being the usual condition, with the paroxysms more severe at night, after the patient has become warm in bed, than during the day.

Paresthesia may occur at any period of life, but is more frequent in middle and advanced age. It may be either general or local. The disease generally attacks one portion of the body at a time, and may spread until the entire surface is involved. In some cases it appears upon certain parts and lingers until eradicated by treatment or through the removal of the exciting cause. Thus, paresthesia may develop on the scalp and face, in which event the forehead, cheeks, nose, and mouth are separately or all together invaded. In old persons it usually appears on the trunk or the extremities, and often on both regions at the same time. The localized form frequently occurs in the axillæ, around and on the genital organs and the anus. The itching and other distressing sensations in the female, when attacked by paresthesia either in the inner portion of the limbs, the anus, the labia, vagina, or clitoris, the affection often first invading only a single part and thence spreading until all are involved, are almost unbearable. The days and sleepless nights are passed with the most intense suffering, until the patient is thoroughly exhausted and often unable to move around. In the male sex the penis, urethra, the scrotum, and the adjoining parts, especially the perineum and anus, are often the seat of the disease, the annoyance being equally intolerable with that experienced by patients of the opposite sex. In both sexes, children and adults as well, the anus frequently becomes the seat of the disease. The itching, burning, smarting, or tingling sensation may be either around the orifice or within the rectum. The perverted sensation is often associated with an ulcer or an inflammation of the rectum, with hemorrhoids and fistula. It sometimes follows exhausting discharges from the bowels in the course of the various form of dyspepsia, and after many local diseases of these parts. The unbearable irritation may be constant, but is usually intermittent. Paresthesia occurring in or around the anus, especially among those who have to appear frequently in public, is a most annoying and distressing affection. The desire to rub or scratch these parts when involved becomes often irresistible. Public speakers, lawyers, clergymen, singers, and even the judge on the bench, if affected, may be driven in the midst of their duties to retire and scratch or rub the parts until their sensibility is for a time deadened.

**Diagnosis.**—As many of the morbid sensations of paresthesia are similar to those in various other cutaneous diseases, great care should be taken to distinguish them from symptoms arising from a distinctly different affection. The history of the case, the absense of any eruption at the outset of the irritation, and sometimes the subsequent appearance of such secondary changes as excoriations, crusts, infiltrated and reddened integument with congested and torn follicles, are all sufficient evidence that the disease is paresthesia. In the localized forms of paresthesia, when eczema or dermatitis complicates the affection, it may be difficult to distinguish one from the other. In such cases the diagnosis must depend upon the history and the subjective symptoms described by the patient. *Prurigo,* a term that has been used by some physicians to express paresthesia, is a distinct malady, having in common only the symptom of itching. Prurigo, as will be seen by the reference already made to it, is primarily a papular affection, and has a different course from paresthesia, which circumstance alone should prevent confusion. Pediculosis of the body, or of the axillary and pubic regions, may be confounded with paresthesia. The secondary changes of hyperemic skin with torn follicles, thickened crusts, due to excoriation with the nails, the itching, and other morbid sensations, are common to both affections. The history, the presence of minute hemorrhagic specks, or what the late Tilbury Fox called "pathognomonic lesions," caused by the local withdrawal of the blood by the pediculi or lice, and, lastly, the presence of the parasite on the underclothing, are conclusive means for diagnosing *pediculosis* of the body. If the eyes, beard, axillæ, chest, abdomen, pubic, genital, and anal regions, or, in fact, any part covered with hair be involved, it will be necessary in all cases, of either sex, to make a most careful examination of the parts before coming to a definite conclusion as to which one of the affections under discussion has appeared. In case the head be involved, the presence or absence of the parasite will unmistakably point to the usual remedies, be treated by the hypodermic administration of codliver oil. Again and again have I, in obstinate cases, resorted to daily injections of a drachm or two (4 to 8 gm.) of codliver oil into the subcutaneous tissue of the back, with the result of a speedy cure. When the affection depends upon derangement of the intestinal tract, exercise, avoidance of spirituous liquors, tea, coffee, tobacco, indigestible food, and the proper medication for each particular case, should be prescribed. In uric-acid cases, a purin-free diet is important, and especially a reduction of nitrogenized food. Pepsin, pancreatin, the acids, alkalies, the tinctures of nux vomica, and ignatia, are all useful drugs. Teucrium scordium, in the dose of eight or ten grains (0.50 or 0.60 gm.) half an hour before each meal, is not infrequently an efficient remedy in paresthesia of the anus or vulva. Hot solutions of sodium bicarbonate, sodium thiosulphate, or simply hot water, are often effective in relieving the itching. A weak solution of phenol (1 or 2 per cent.) applied with a soft sponge is a useful local anesthetic. Dr. Thomas D. Savill has found calcium chloride beneficial, given in doses of not less than twenty grains (1.30 gm.) thrice daily, the amount being gradually increased to thirty (2 gm.) or even forty grains (2.60 gm.). Patients of highly neurotic temperament may be benefited by a nervous sedative, as valerian, castor, musk, asafetida, or hydrocyanic acid. Chloral hydrate, the bromides, and even, in some instances, opium, may also be of service.

Diseases of the viscera, especially of the liver and kidneys, should be treated according to the indications in each case. In jaundice, Murchison recommends the use of bicarbonate of potassium to relieve the itching. Genito-urinary diseases in both sexes are to be treated by correcting the general health, and by paying attention to the local lesion in each patient. Pick and Simon report good results from the use of pilocarpine. Simon recommends likewise the syrup of jaborandi. The author has employed the latter and also the infusion of jaborandi, the effect of neither being at all decided. The tincture of gelsemium, in fifteen-drop doses every half hour until from one to two drachms (4 to 8 gm.) are taken, has been recommended. Phenol and many other drugs have been employed with like experience. Icard secured very rapid improvement in a case of nine months' duration, by the internal administration of forty-five grains (3 gm.) of salicylate of sodium daily. In several cases C. Lange saw marked relief follow the combined administration of sodium bicarbonate and lithium carbonate. In paresthesia, dependent upon hysteria or other functional derangement of the nervous system, Blaschko recommends antipyrin given internally in full and frequent doses. Cannabis Indica is also sometimes successfully used for the same purpose. Both antipyrin and salicylate of sodium, however, often fail, and are, moreover, attended by the disadvantage that they themselves may excite an eruption which complicates the condition. Wine of antimony is also recommended by some writers. Strophanthus may prove of service in those cases dependent upon stasis of the cutaneous circulation caused by disease of the heart or lungs. Among other substances which have been internally administered for the relief of paresthesia are belladonna or atropine, hyoscyamus, bromide of arsenic, veratrine, brucine, quinine, etc.

Change of food, climate, and scene will, through their joint effect upon the system, sometimes cure obstinate and previously intractable cases. External treatment is of the greatest benefit, both to afford relief from the intolerable irritation and to combine with internal medication toward effecting a cure. Probably the most important of all the agents the author has employed for both temporary and permanent relief are electricity, massage, and water, for their stimulating, sedative, and tonic effects. Inasmuch as these agencies have been known and used for a very long time, it is to be regretted that they have been and are applied to so slight an extent. I have been employing one or another of them for several years, often with the happiest result, in managing some of the most obstinate cases of paresthesia. Electricity is, without doubt, the most valuable of the three agents mentioned. It influences both directly and indirectly, through the reflex action of the nerves of the part. Faradization and galvanization can both be used for local and systemic effect. If the patient is weak, nervous, and much prostrated, mild local faradization, with central galvanization, is often most effective. In cases attended with much alteration of the integument, especially with infiltration, the faradic current, given alone or alternated with local galvanism, will often stimulate the dormant absorbents to remove the exuded products, and have both a sedative and a tonic action upon the parts.

In regard to the frequency of application of electricity, it is obvious that the capacity of receiving the current must vary with the case. Some persons bear not only with ease but with positive relief and pleasure (the operation alleviating the itching) either a mild or a strong current once every day or two, while others are not benefited by its administration more frequently than twice a week. Each case must therefore be carefully studied with the view to ascertaining individual idiosyncrasy, and thus the dosage be properly apportioned. The electric treatment, combined with proper internal medication, has in my hands ameliorated the condition of many to whom life itself under the horrible attendant sensations had become a burden, and has in very many instances effected a permanent cure after all other treatment had failed. Massage is the second most useful application in order of efficiency, and often acts like magic in arresting the irritation of the parts involved. Massage can be performed by pinching the skin, and at times the muscles, by tapping and beating, and by passive movement of the general and affected surface. I often order, with the view to secure both local and constitutional effects, the treatment to be applied to the general surface of the body as well as to the part immediately involved. This equalizes the circulation, removes the exuded products, nullifies through its sedative action all nervous irritation, and is most agreeable, often producing sleep after futile efforts with many hypnotics.

The third agent in order of importance is water employed at various temperatures, used either alone or combined with some medicated substance. Some patients are benefited by hot or cold douche-baths, or by fomentations, and sometimes alternation of the two affords the most relief. The use of the various medicinal liquid baths often proves of service in allaying the irritation. Those of the greatest efficiency are the emollient, alkaline, naphthol, alum, tannin, and the sulphuret of potassium. Again, the Turkish, the simple vapor, the electro-vapor, and the medicated-vapor baths of sulphur, mercury, tar, and of the balsams are beneficial. Numerous medicated substances claim attention from their anesthetic or soothing action on the skin. One of the most useful of them for affording temporary relief is menthol. Eichhoff writes favorably of the effect of a five-per-cent. super-fatted menthol soap, the body or the affected part being washed night and morning in a lukewarm bath with the soap. In obstinate cases the lather is allowed to dry upon the body, and is only removed in the next bath. The employment of one of the oily preparations, as, for instance, olive oil, glycerin, glycerole of starch, either before or after a bath, and constantly applied to the parts, with or without a bandage, may agree with some cases. In others the various ointments, such, for instance, as that of alum, bismuth, lead, the zinc and the mercuric oleates, especially the latter in case of much alteration of the skin, may be indicated. An ointment containing cocaine hydrochloride rubbed up with lanolin and olive oil is serviceable. Purified wool-fat has itself some virtue in relieving itching, and is therefore peculiarly appropriate as an excipient. An ointment made by adding boroglycerin to cold cream is a soothing application. Betanaphthol, camphor, salicylated camphor, creosote, and aconitine are also serviceable ointments. An emulsion of oil of bitter almond will sometimes afford relief.

Pruritus senilis is at times relieved by an ointment consisting of one part of the oil of stavesacre to seven parts of lard. Phenol, creolin, creosote, and tartaric acid, one to twenty parts of glycerite of starch, are likewise agents upon which some reliance can be placed. The following prescriptions may be used with advantage:

| | | | | |
|---|---|---|---|---|
| ℞ | Extracti erythroxyli | ʒij. | 8. | |
| | Adipis | ℥j. | 32. | M. |

| | | | | |
|---|---|---|---|---|
| ℞ | Betanaphthol | ℈j. | 1.30 | |
| | Extracti belladonnæ fol. | ʒss. | 2. | |
| | Adipis | ℥j. | 32. | M. |

Opium or morphine with menthol, sulphur, and the carbonate or oleate of zinc may be added to the combinations just given, often with decidedly good effect. The following prescriptions may likewise be employed frequently with benefit:

| | | | |
|---|---|---|---|
| ℞ Hydrargyri ammoniati | ℈j. | 1.30 | |
| Olei anthemidis | ♏ v. | 0.30 | |
| Pulveris marantæ | ʒj. | 4. | |
| Morphinæ acetatis | gr. iij. | 0.18 | |
| Ungt. aquæ rosæ | ℥j. | 32. | M. |

A useful preparation in paresthesia of the genitalia and anus:

| | | | |
|---|---|---|---|
| ℞ Camphoræ, | | | |
| Chloral. hydrastis āā | gr. xl. | 2.60 | |
| Extracti arnicæ | ʒss. | 2. | |
| Extracti opii | gr. xx. | 1.30 | |
| Adipis | ℥j. | 32. | M. |

A combination which can be employed with advantage, especially if there is much change on the skin:

| | | | |
|---|---|---|---|
| ℞ Acidi tannici | ℈j. | 1.30 | |
| Extracti belladonnæ fol. | ʒss. | 2. | |
| Extracti opii | gr. x. | 0.60 | |
| Ungt. aquæ rosæ | ℥j. | 32. | M. |

An effective application to use in iritation of the perineum and anus:

| | | | |
|---|---|---|---|
| ℞ Ungt. hydrargyri nitratis | ʒiij. | 12. | |
| Camphoræ | ʒj. | 4. | |
| Adipis lanæ hydrosi | ℥j. | 32. | M. |

Good results have at times followed from this combination.

The calamine and zinc lotion is very widely known. L. D. Bulkeley uses the following formula:

| | | |
|---|---|---|
| ℞ Phenolis | ʒssj. | 2-4. |
| Pulv. calamin prep. | ʒj. | 4. |
| Zinci oxidi | ʒij. | 8. |
| Glycerini | ʒiij. | 12. |
| Aquæ calcis | ℥j. | 30. |
| Aquæ rosæ q. s. ad. | ℥iv. | 120. |

M. To be applied freely to the surface.

He also uses the liquor picis alkalinus:

| | | |
|---|---|---|
| ℞ Picis liquida | | |
| Potassa caustica | | |
| Aquæ | ʒx. | 40. |

M. Sig.: To be diluted with from ten to twenty parts of water. After applying this use a bland ointment as a dressing.

The use of impure carbonate of zinc, bismuth and lead salts, or zinc oleate, dusted over the body after a bath, employed conjointly with oils or ointments, is often beneficial. A mixture of ten parts of salicylate of bismuth and ninety parts of starch powder is highly spoken of by Besnier. Plasters also are sometimes efficacious in paresthesia. These preparations have the additional advantage of interposing an obstacle to the act of scratching, thus protecting the skin while at the same time their ingredients modify morbid sensibility. Plasters may be composed of cod-liver oil, pure or mixed with phenol, betanaphthol, or resorcin, etc. They are left in contact with the integument as long as they can be borne. Lotions sometimes suit individual cases. Thus black-wash, lime-water, alone or combined with glycerin, glycerin with essence of peppermint, or the fluid extract of erythroxylon or conium, either alone or mixed with water, are useful. Among other excellent applications may be named diluted acids, especially sulphurous acid, diluted alkalies, diluted alcohol, tincture of benzoin, the tarry preparations, infusions or decoctions of oak-bark, tobacco, aconite, poppy, belladonna, lead-water and laudanum; camphorated alcohol diluted or combined with glycerin and borax, salicylic acid dissolved in alcohol, sulphuric ether, petroleum ether, a solution of bromide of potassium, creolin or phenol, and hydrocyanic acid, two drachms (8 gm.) to half a pint (256 gm.) of rose-water and glycerin.

The following are also useful: The corrosive chloride of mercury, three to five grains (0.18 to 0.30 gm.) to the ounce (32 gm.) of water; sulphate of morphine, three to five grains (0.18 to 0.30 gm.) to the ounce (32 gm.); chloral hydrate, thirty to sixty grains (2 to 4 gm.) to the ounce (32 gm.); sulphate or hyposulphite of sodium, a drachm (4 gm.) to the ounce (32 gm.); and acetate of lead, thirty to sixty grains (2 to 4 gm.) to the ounce (32 gm.). The hypophosphite of sodium combined with liquefied phenol and glycerin has been used with success. In paresthesia of the female genitals, injections of hot water, simple or medicated, into the vagina, are often effective. One of the best combinations in such cases is one-half ounce (16 gm.) each of powdered alum and borax to a quart (1,024 gm.) of hot water, as an injection as well as for direct application to the external parts. A highly recommended method consists in washing out the vagina with a solution of one part of hydrogen dioxide to three parts of water and subsequently dusting the vagina and vulva with boric acid. A mixture of half an ounce (16 gm.) of fluid extract of grindelia robusta with five or six ounces (160 or 192 gm.) of water applied upon absorbent cotton, is of avail in some cases. In other instances painting the seat of disease with silver nitrate is effective. The potassium chlorate, from one-half to one ounce (16 to 32 gm.) to the same quantity of water, is sometimes equally effective. P. Bock had good results from an ointment containing one to five parts of picric acid to one thousand parts of excipient. Conium ointment is sometimes capable of affording relief. In pruritus hiemalis it is necessary that the body should be well protected against variations of the temperature. Warm baths are of service. Resorcin is esteemed in pruritus hiemalis.

Pruritus ani appears to be attributable not to a local, but to a constitutional cause, and is due to some trophic changes in the nerves supplying the parts. Dr. L. J. Krouse, of Cincinnati,[1] states that the changes occurring in the skin of the anus and surrounding parts, namely, the hypertrophy, the loss of pliability, and the absence of pigment, can only be explained on the theory of a faulty nervous supply of the parts. He shows that an increase of pigment ought to accompany severe itching, and not a total disappearance, and pointed to the fact that the absorption of the normal coloring matter of the affected area does occur, notwithstanding that the epidermis was not destroyed. A similar process of absorption takes place in leucoderma, in which all authorities acknowledge that the cause is to be found in the nervous system. From this standpoint, therefore, pruritus ani, at least in such cases, is a disease *per se*, and not a mere symptom. Cotton saturated with solution of chlorinated lime and introduced within the anus is said to relieve pruritus, especially when caused by seat-worms, which frequently occur in children. The following has been recommended as almost a specific in cases of pruritus ani: Take of sulphate of zinc and alum equal parts; heat the two until all the water of crystallization has been driven off, and dissolve the residue in water (ʒj to ℥j). The solution must be applied freely to the site of irritation. In cases of simple character, applications of phenolized water, after evacuation of the bowels and at bed hour, may be sufficient (ʒj to Oj). In some patients coffee causes pruritus ani, and this should be inquired into in each case. In severe and persistent cases of pruritus ani, Dr. J. M. Matthews, of Louisville, has secured favorable results by destroying the peripheral nerve-fibres, either by actual cautery or division by the knife.

**Prognosis.**—Paresthesia is an obstinate and often an unyielding affection. Great caution should be exercised in the prognosis, as much depends upon the exciting cause and the power of the physician to remove it. In very old persons, in senile alteration, or organic disease, the affection is usually incurable. In a few instances, some of the forms of treatment just described merely allay the symptoms for a short time and must be replaced by others, and they, in turn, but briefly performing their intended function, be changed continually, until the patience of both physician and sufferer is almost exhausted. Perseverence and an occasional change of the remedies used will, however, generally result in relieving the most obstinate and distressing cases of the disease. By reason of the insomnia which it produces, especially in those of extremely nervous temperament, paresthesia may seriously impair the general health.

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[1] Proc. Am. Proctologic Society. Med. Bull., Oct., 1907.

## CLASS IX.

## PARASITES.

*(Parasitæ.)*

### *ANIMAL.*

### SCABIES.

**SYNONYMS.—Psora—Krätze—Gale—Itch.**

SCABIES is a contagious animal parasitic disease of the skin, produced by the presence of the acarus scabiei, which gives rise to the appearance of cuniculi or burrows, papules, vesicles, pustules, excoriations, and crusts, or other primary or secondary lesions, and is attended with itching.

**Symptoms.**—The extent of the morbid changes which this animal parasite, *acarus scabiei* (or *sarcoptes scabiei*), will produce on and in the skin, is dependent upon the individual's condition, whether the health be good or bad, especially as regards personal cleanliness; and whether the disease has been observed and treated in its early stage. In the first place. reference shall be made to the lesions which this itch-mite gives rise to in both the early and the late period of contagion; and, secondly, to phases of the disease. At the time of contagion, at the moment when the female insect obtains lodgment upon the skin, it at once penerates the horny layer of the epidermis, through which it burrows in a somewhat curved direction. While the female acarus thus forms a canal or cuniculus, in which she lays her eggs to the number of twenty-four to fifty, the male wanders over the surface, or hides among the scales or crusts. In a short time the ova in the burrows are hatched, young mites come to the surface, become impregnated, and in their turn burrow, forming vesicles, papules, and pustules, which usually first appear on the hands, being limited to a small area, and which eventually extend to other regions. In the course of from two to three weeks after the young mites have been hatched out and in turn have at various points burrowed, setting up more or less irritation, the disease becomes fully developed. The irritation thus excited by the burrowing of the mites into the epidermis, and the consequent indulgence of the patient in scratching, causes the integument to become more or less covered with primary and secondary lesions similar to those observable in eczema.

In some persons the eruption is slight, the burrows, vesicles, pustules, and papules being distinct and seen without difficulty. In the majority of cases, however, the surface is the seat of many and variously sized vesicles, papules, and pustules, more or less torn, with here and there crusts, hemorrhagic spots, excoriations, and fissures from scratching, the parts being slightly or markedly inflamed. Typical and well-developed cases usually present such an appearance. All lesions cited may not, however, be present at the same time. Unless checked, the affection becomes worse and worse, and especially pronounced in the pigmentation of the surface, until it involves not only its regions of predilection, but gradually encroaches upon and covers the whole skin. The secondary changes produced by irritation, scratching, and infection from the nails, frequently become so prominent as entirely to mask the original disease.

Now that the general symptoms of the disease have been considered, the next reference will be to the morbid appearances produced by the presence of the parasite. These, of course, vary according to the condition of the patient when attacked, the length of time since the commencement of the disease, and the locality of the ravages of the mite. The female insect on entering the skin usually produces through that irritant action a vesicle, bleb, or pustule of greater or lesser size, the beginning of the furrow. She gradually burrows beneath the horny layer of the epidermis, forming a slight canal that is approximately straight or curved or circular in form, and varies from part of a line to four or five in length. This canal is either speckled, uniform white, or dark in color, depending upon the habits and occupation of the patient, and the foreign material that has in consequence come into contact with the parts. The female, having burrowed in such regions as the hands, wrist, extensor surfaces of the limbs, or other parts, and laid her eggs, secretes herself at the end of the canal in a bed which may be recognized as a small white speck. The mechanical irritation to the nerves of the skin set up by the hatched mites soon gives rise to itching, which leads to scratching with all its evil consequences. The itching is either mild or severe, but most commonly exasperating, especially when the patient is warm in bed at night, and persons rub, scratch, and tear the integument, which then becomes the seat of abraded vesicles, papules and pustules. Not only is the epidermis thus lacerated, but often the corium beneath it also, serum and blood escaping and forming into crusts, which, mingling with wheals, papules, and excoriations, give the characteristic appearance of the ordinary developed case of scabies. In long-standing cases, or in those of persons out of health, the skin becomes markedly altered, its infiltration and pigmentation often being most conspicuous.

Scabies has, as intimated, a predilection for certain parts of the body, portions of which, too, are more scratched than others, as, for example, the anterior regions, especially those below the breasts. The parts most frequently invaded are the hands, the palms, the backs and sides of the fingers, particularly the clefts between them, the wrists, the extensor surfaces of the limbs, the folds of the axillæ, the buttocks, and the toes, the dorsal and the plantar surfaces of the feet, and particularly just above the internal malleolus. In the male sex, owing to the necessity of the hands being frequently brought into contact with the penis, the contagion is frequently spread to this organ and the scrotum. In a case observed by Sämisch the cornea was attacked without any evidence of disease upon the skin. In the female the nipples are the part usually invaded. The scalp, face, breasts, abdomen, and extremities of infants may receive contagion from the nurse, by whom the contagion is generally spread through touching these parts. While it is true that the acarus scabiei by preference seeks for its attacks those regions that have been mentioned, it is also true that an irritated surface, or one subjected to tight bandaging, is especially subject to invasion.

The fact that the parasite is sensitive to cold and especially active under the influence of heat, accounts for the facts that the face is especially exempt; that the exposed parts are comparatively comfortable during the day, but that, when covered at night, the itching becomes more intense than usual.

**Diagnosis.**—The morbid changes, especially that represented by the burrow, are all-sufficient for making the diagnosis. The burrows should be sought for the moment the disease is supposed to be parasitic. It will in the early stages be almost impossible to detect canals, for the parasite has not then quite formed them, and after the disease is fully established the scratching may have obscured or destroyed the evidence sought. Occasionally a skilled eye and dexterous hand may with a good lens be able to observe upon the sides of the patient's finger's either the burrows or their remains. During such an examination the parasite may be caught by inserting a fine needle into the white speck at the end of the burrow. Remember that the insect is not in the vesicle, but in the locality named. Absence of burrows and parasites, or, rather, what is implied, failure of the physician to detect them, should by no means at once preclude the supposition that the disease may really be due to the acarus. Other evidence must be sifted to render the diagnosis conclusive—the history of contagion, the appearance of the secondary eruption, its distribution to the favorite habitat of the parasite, such as the fingers, the inner part of the wrist, the penis, the axillary folds, the abdomen, and the buttocks, particularly in those persons who are sedentary in occupation. The burrows can not be found upon the hands of those who, like washerwomen, must often dip their hands in water, or of workers in chemicals, or of individuals in whom, as blacksmiths, the epidermis becomes very hard. Notwithstanding the employment of these capital indices as means toward forming a diagnosis, there are two diseases especially, eczema and pediculosis, which closely resemble scabies in symptoms, and with which, in consequence, it is liable to be confounded. And, to complicate matters, it must not be forgotten that scabies and eczema sometimes coexist. There are, however, certain peculiarities of the eruption in *pediculosis* that will generally enable one to distinguish it from scabies, especially if they happen to be at the same time present upon the same individual, and the peculiarity of the eruption in scabies should enable the physician to make the differential diagnosis between it and eczema.

In scabies the vesicles are similar in their form to those of *eczema*, but in their sparse and isolated development, and their situation upon the favorite region of scabies, they differ very much from the many vesicles which, in eczema, are grouped. Again, while the papules in scabies are not distinctively different, to all appearance, from those of eczema, yet they present certain conditions peculiar to themselves, such as being isolated and torn from scratching, and as occurring on the anterior parts of the trunk and the flexor surfaces of the limbs. What has been stated concerning the vesicular and papular eruptions observed in scabies would also be true of the pustules if they should appear in the course of this disease. The pustules are in no way peculiar, but their appearance on certain regions, as, for instance, the fingers, toes, or buttocks, points very strongly to scabies.

**Pathology.**—In connection with the discussion of the lesions produced by the acarus scabiei, the anatomy and natural history of the parasite may be briefly described. The acarus scabei, sarcoptes scabiei, or sarcoptes hominis, commonly called the itch-mite, is a very minute insect belonging to the class *Arachnoidea*, order *Acarina*, and family *Acaridæ*. It is the female acarus only which, by her burrowing in the epidermis, occasions the lesions on the skin, the male remaining upon its surface. The female, which is much larger than the male, can be observed beneath the epidermis in her resting-place as a yellowish or whitish speck, and can at times be extracted with the point of a needle. The slight elevation caused by the presence of the insect was called by Bazin the acarian eminence. The female insect when thus exposed is found to be barely visible to the naked eye, but is fully recognizable under the microscope as a minute insect from one-fifth to one-sixth of a line in length, and from one-sixth to one-eighth of a line in breadth, with an oval, tortoise shape, convex on the dorsal and flat on the ventral surface of the body, the sides indented, and the ventral surface traversed by tortuous lines.

The back of the parasite is covered with short spines and long, spike-shaped processes, directed backward. The head, which is small and oval, is without eyes, and is furnished with palpi or feelers and mandibles or cutting jaws. The body is furnished with eight legs, the four in front near the head being short, thick, conical, pointed, and having cup-shaped suckers and hairs, and the four behind having attached to them only long hairs. On each side of the body two bristles appear, and posteriorly four. Muscles, stomach, intestines, ovaries, and two ventral outlets have been discovered, but as yet the existence of neither circulatory nor nervous system has been proved.

The male acarus is about half the size of the female. In the male the posterior legs are supplied with suckers, instead of with the hairs present in the opposite sex. The genital organs are well developed. It is stated that the male usually dies after copulation, in from six to eight days' time. The young acarus may be known by having but two posterior legs. The female, as said before, having made her burrow in the skin, proceeds to deposit in it from twenty to fifty eggs, and survives the operation only from one to two months. Occasionally she lodges beneath the epidermis without making a regular burrow. The eggs are in form ovoid and about one-twelfth of a line in diameter. If a burrow be carefully cut out of the integument with either a knife or scissors and placed beneath the microscope, the parasite, eggs, and embryos will generally be seen, and mingled with them some black specks—the feces. The young acarus hatches out in about a week, and makes its exit through the opening by which the parents came, or by means of a rupture of the side of the burrow. The mite again buries itself in the skin, and undergoes three changes before reaching full development.

The lesions in and on the skin are produced by the disease through the instrumentality of the burrowing of the insect and by the mechanically excited inflammation of the skin through scratching. With the exception of the burrows, the lesions produced are similar to those seen in the various forms of eczema. The extent of alteration of the skin that follows will depend upon the general physical condition of the individual affected, upon whether or not he is naturally possessed of a sensitive skin, and up the duration of the disease and the amount of scratching that has been indulged in by the sufferer.

**Etiology.**—The cause of scabies has already been stated to be due to the ravages of the itch-mite, but it has also been said that the virulence of the eruption is produced by the patient's scratching. The disease is contagious. It attacks all classes, all ages, and both sexes. Scabies is, however, more common among men than women, on account of their being, more than women, accustomed to sleep together. It affects the healthy as well as the unhealthy, but thrives better, however, upon the skin of the latter class. Itch is without doubt contracted most frequently through persons sleeping together, or from the seat of a water-closet in a public place, such as a hotel, or railway station. It may, exceptionally, be transferred from one person to another by shaking hands, or by reclining upon a bed or couch, or through gloves, clothes, or other articles of apparel worn by one person and then by another. It is hardly likely, however, to be generally communicated by these means, for in college and hospital clinics both students and myself, in making examinations, have handled scabies patients for some time without in any instance developing the disease. In one case I attempted, at his own wish, to inoculate a member of the class with the material scraped from the lesions of a patient who had the itch, and had to repeat the experiment several times before it was successfully accomplished. Yet, as may be remembered, Napoleon once acquired itch from having handled the rammer of a cannon. In order to develop the disease, individuals representing the two sexes of the insect, or an impregnated female, must obtain lodgment on the skin. It is no doubt frequently transferred, as Hebra has observed, through the scales and crusts in which the parasites are located, or through the agency of the finger-nails that have torn them from the skin in the action of scratching. Uncleanliness, filth, and crowding together of many persons in tenement-houses, on ships, and in camp-life conduce to the propagation of scabies. Scabies is particularly active among emigrants and among soldiers in large armies, under those conditions where men are brought into close contact with one another and compelled to neglect the ordinary hygienic laws. During the late civil war in the United States it was propagated to a great extent, in both the Northern and Southern armies, from the herding together of many persons and from uncleanliness. It was at this time that I witnessed its effects on very many persons, in the keen suffering that it caused. In a large rural town in which I then resided, through which both armies passed, scabies became almost epidemic. There was hardly a family in the place exempt from its ravages; but since that time scabies has entirely disappeared from the town. Scabies is at present, in the United States, a rare affection. It is more commonly than elsewhere seen in our larger seaboard cities, communicated generally by newly arriving immigrants. At the clinics of the Medico-Chirurgical Hospital of Philadelphia, cases are seldom seen, and in the dispensary service of the Philadelphia Hospital for Skin Diseases only seven out of fourteen hundred and forty-six cases of skin-disease were observed. While scabies is, as already remarked, comparatively rare at present in this country, it is more common in the East than in the West, and is prevalent in Sweden, Norway, Austria, Germany and France.

**Treatment.**—The treatment of scabies is usually simple, and can be accomplished solely by external means. The object of the treatment is the employment of such agents as possess the power of not only destroying the itch-mites and their eggs, but of relieving the secondary eruption that may be present. For this purpose any one or a combination of many well-known remedies can be used; but before making a selection among them, it is necessary to consider which would be most applicable to the case under consideration. In order to choose intelligently, therefore, the physician should especially consider whether the subject be a child or an adult, the sex and age of the patient, and the condition of the skin, whether it is naturally sensitive, or hardened and coarse. Again, he should be mindful of the duration of the disease, and of the amount and extent of the secondary changes that have occurred. Lastly, and above all, the position in life should be considered, and whether the treatment is to be for private or for hospital cases. Naphthol is a remedy that seems to meet all the indications detailed. It is applicable in varying strength in the form of an ointment for children as well as adults, whether the skin be sensitive or hardened. It is efficient and valuable, not only from the fact of its ability to kill the itch-mite, but also from its being odorless, and beneficial to the inflamed skin. Betanaphthol may be prepared for application as follows:

| | | |
|---|---|---|
| ℞ Betanaphthol | ʒss. | 2. |
| Adipis recentis | ℥j. | 32. |

M. Ft. ungt.

Also

| | | |
|---|---|---|
| ℞ Betanaphtholis | gr. xx. | 1.33 |
| Sulphuris precipitati | ʒj. | 4. |
| Balsami Peruvianæ | ʒj. | 4. |
| Unguenti zinci oxidi | ℥j. | 32. |

M. Fiat unguentum. Sig.: Apply freely twice daily to the parts affected.

The patient should always take a hot bath before applying the ointment for the first time, then every second night before retiring. Patients should change their underwear and bed linen every second day so as to prevent reinfection.

Kaposi called the attention of the profession to the utility of the following prescription for scabies:

| | |
|---|---|
| ℞ Betanaphthol | 15 parts. |
| Pulv. cretæ albæ | 10 " |
| Saponis virid. | 50 " |
| Adipis | 100 " |

M. Ft. ungt.

On account of its greater penetrative power, purified wool-fat, or lanolin, may serviceably be substituted as the excipient in the above formulæ. The superior advantages of naphthol ointment in the treatment of scabies have been shown by Hardy and Guerin, of Paris, and many other observers.

Resorbin is also valuable as a vehicle for parasiticides. Resorbin is an emulsion of almond oil with distilled water, yellow wax, gelatin, and soap, brought to an exact consistence by the addition of wool-fat.

Dr. H. Emery, of Paris, recommends the use of a petroleum soap in obstinate cases of scabies. The soap is composed as follows:

| | |
|---|---|
| Petroleum (crude) | 50 parts. |
| White wax | 40 " |
| Alcohol | 50 " |
| Soap | 100 " |

In similar cases, Tresilian has derived benefit from phenolized oil, in the proportion of one part of liquefied phenol to fifteen of olive-oil. The preparation is well rubbed in, and the case is usually cured within two or three days. The anesthetic action of the phenol soon abolishes the itching.

Chlorinated oil has also been, for some years in my experience, a most serviceable remedy in scabies. The well-known effects of chlorine lotion, a very old remedy, caused the writer to experiment with olive-oil saturated with dry chlorine gas, with even better results than with the former preparations. What I have termed "chlorinated oil" is ordinary olive-oil saturated with chlorine. It contains many volumes of chlorine, and, the chlorine having lost its identity and odor, makes an unobjectionable remedy that acts without irritation or inconvenience to the patient. Styrax is a valuable remedy on account of its pleasant odor and its cleanly and unirritating effect. McCall Anderson recommended, in preference to all other remedies, styrax in the form of the following ointment: Styrax, one ounce (32 gm.); lard, two ounces (64 gm.); melt and strain. Sulphur was formerly the remedy I mainly relied upon for the treatment of scabies, used in from one-half to two or more drachms (2 to 8 gm.) to the ounce (32 gm.) of lard. While it is, no doubt, a most effective remedy employed alone or in combination with other agents, yet its pungent, penetrating, and unpleasant odor makes it very objectionable for applications in private practice. I esteem sulphur a remedy of much value in dispensary and hospital practice, and often, in long-standing cases that have resisted its application in the form of an ointment, I have obtained additional good effects by administering an occasional sulphur-vapor bath. Combinations of sulphur have also been employed, as the sulphide of potassium, iodide of sulphur, and hyposulphite of sodium. Col. S. C. B. Robinson,[1] of the British army, reported the treatment of 51 cases of scabies with balsam of Peru, with satisfactory results. He gives the following directions: The patient should lie in a very hot bath for at least half an hour, and be thoroughly scrubbed with flannel and ordinary soap. Particular attention should be paid to the parts that are obviously affected by the disease. He is then quickly dried, and varnished all over with a mixture of balsam of Peru 3 ounces and glycerin 1 ounce. This application—best applied by a soft, worn nailbrush—is well rubbed into the skin. The above quantity will be found sufficient to varnish an ordinary-sized man. He then puts on hospital clothing, the cotton shirt being worn next the skin. His ordinary clothing and his barrack bedding are sent to be disinfected. In very bad cases it is advisable to give a second scrubbing to the worst places next morning. He concludes: "No patient who has been properly varnished has ever reported that his next night's sleep has been disturbed by itching; and if the remedy has been faithfully applied according to the above instruction, that is the end of the case. If it were possible to disinfect the patient's uniform and bedding while he is being rubbed, there would be no necessity to admit him to the hospital at all. All these cases come up for observation once a week, for three weeks. The average detention in hospital has been about three days."

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[1] British Medical Journal, March 30, 1907.

At the present time, it is a little uncertain whether the ova are killed at the same time the parent undoubtedly is, namely, within the first few hours. For this reason it is thought advisable to prohibit bathing for seven days. Further observation may show that it is possible to reduce this period to three or four days. Sapo viridis, tar in its various forms, liquefied phenol, potassium carbonate, the mercurials, staphisagria, lime, the essential oils, iodoform ointment, chrysarobin (gr. xxx to the ounce of petrolatum), creolin, turpentine, and a host of other remedies, have been recommended either alone or combined, with or without sulphur. Creosote ointment has also been found effective. The great objection to the employment of most of the agents named is their unpleasant odor, and frequently their irritant action. In the event that the skin will bear it, the following ointment of Bourguignon will be found useful; if too stimulating, the oils and sulphur may be decreased in quantity:

| | | |
|---|---|---|
| ℞ Olei lavand.,<br>Olei menth.,<br>Olei carophyll.,<br>Olei cinnamon | āā ℈j. | 1.30 |
| Pulv. tragacanthæ | ʒj. | 4. |
| Potassii carbonatis | ℥j. | 32. |
| Sulphuris sublimati | ℥iij. | 96. |
| Glycerini | ℥vj. | 192. |

M. Ft. ungt.

The following ointment can also be recommended:

| | | |
|---|---|---|
| ℞ Sulphuris sublimati | ʒj. | 4. |
| Olei cadini | ʒj. | 4. |
| Balsami Peruviani | ʒj. | 4. |
| Adipis | ℥j. | 32. |

M. Ft. ungt.

Vleminckx's solution and Helmerich's ointment are both valuable, providing there is no objection to them on account of their odor, and that they are not too strong applications for the skin. The first-named preparation is made as follows:

| | | |
|---|---|---|
| ℞ Sulphuris sublimati | ℥j. | 32 |
| Calcis | ℥ss. | 16 |
| Aquæ destillatæ | ℥x. | 320. |

Coque ad ℥vj (192 c.cm.), deinde filtra.

After the use of the bath, two applications of this preparation are said to cure the itch. Helmerich's ointment is prepared in the following manner:

| | | |
|---|---|---|
| ℞ Florum sulphuris | ʒij. | 8. |
| Potassii subcarbonatis | ʒj. | 4. |
| Ungt. simplicis | ℥j. | 32. M. |

Hardy and others in France employed at one period a rapid method of treatment, by rubbing the patient for half an hour with sapo viridis, placing him in a warm bath in which he remained another half-hour, and then rubbing the parasiticide well into the affected part, when the disease was cured. Wilkinson's ointment—the formula of which, as modified by Hebra, is often more suitable to employ than the original—as in the unguentum sulphuris compositum (N.F.) is:

| | | | |
|---|---|---|---|
| ℞ Calcii carbonatis precip. | | gr. xliv. | 10. |
| Sulphuris sublimati | ʒj. | gr. vi. | 15. |
| Ol. cadini | ʒj. | gr. vi. | 15. |
| Sapo mollis | ʒij. | gr. xij. | 30. |
| Adipis | ʒij. | gr. xij. | 30. |

M. Ft. ungt.

Four applications of this ointment are made within forty-eight hours, after which the patient lies between woolen blankets or wears woolen clothing, and at the end of a week the treatment is concluded by a bath. The application, while effective, is tedious, painful, and more adapted to hospital than to private practice. Radcliffe Crocker advocates treatment by baths containing sulphide of potassium in the proportion of four ounces (128 gm.) to thirty gallons (113 Litres) of water at a temperature of 100° F., the patient remaining immersed for a quarter of an hour. He states that one or two baths are usually curative, but that three are generally given. The application of one or another of the remedies or combinations described should usually, unless contra-indicated, be preceded by a hot bath, with soap, after which the preparation to be used should be well rubbed into the part twice a day for at least three days. At the end of this time another bath should be taken, and the skin critically examined to ascertain if the itch-mites have been destroyed. The parasiticide should, however, be continued, notwithstanding that the irritation may have lessened, until all evidence of the presence of the itch-mite has disappeared. The skin may continue inflamed even though the insect has been destroyed. The disease, it should be noted, may be overtreated, and the skin so irritated by the remedies employed to destroy the parasite as to demand the use of the soothing or astringent remedies described in the chapter on eczema. It is especially to be remarked that sulphur ointment is liable to cause irritation, and its effects should be carefully observed. Some patients do not appear to tolerate ointments containing sulphur in any strength. The Peruvian balsam is much better borne, as a rule, than sulphur.

It is of importance that, after the disease has been cured, the clothing should be exposed to a heat of 212°, in order to destroy any parasites which may adhere to them and prevent a renewal of the affection. The seams should be pressed with a hot iron. Gloves should be burned.

**Prognosis.**—Scabies is a curable disease in from one to two weeks' time. If the treatment is not properly carried out, or the disease has existed for some time or is complicated with severe secondary lesions, the restoration of the skin to its natural condition may be long and tedious. A rapid cure in private practice will depend upon a hearty co-operation at all times upon the part of the patient.

## PEDICULOSIS.

SYNONYMS.—Phtheiriasis—Läusesucht—Phthiariase—Pou (Fr.)—Lousiness.

Pediculosis is a contagious disease caused by animal parasites called pediculi, or lice, which attack the skin. It is attended frequently by primary and secondary lesions.

**Symptoms.**—The parasite infesting the human body known as the louse belongs to the class *Insecta,* order *Hemiptera,* and family *Pediculidæ.* It is a wingless insect, of which there are three species, the pediculus capitis, pediculus corporis, and pediculus pubis, infesting respectively the head, the body, and the pubes. These three species of lice cause, in attacking the body, a slight or a great annoyance, sometimes entailing much suffering. The various symptoms which they originate may be best described under each of the species just named.

PEDICULUS CAPITIS.—The head-louse is found chiefly upon the scalp, and but rarely upon other regions of the body. It measures in length about two millimeters, and in breadth one millimeter, the female being larger than the male. Its color is generally grayish, but, as Geber remarks, it may change its tint with that of the skin of its host, being on the Esquimaux white, on the negro black, and on the Chinese yellowish-brown. In shape it is elliptical, and consists of a head, thorax, and abdomen.

The head of this species of louse is triangular or acorn-like in form, and is furnished with a pair of five-jointed antennæ and a pair of large, black, conspicuous eyes. The thorax, which is broad, has projecting from its sides six hairy legs furnished with stout claws. The abdomen, which includes more than half the length of the insect, is divided on each side into seven well-defined segments. In the male there protrudes from the back a large wedge-shaped penis with testes. The female possesses ovaries, the oviducts of which communicate with the vagina, which terminates upon the ventral surface. The female deposits in the course of a week about sixty eggs, or nits, which are white and elliptical in form. They are usually glued to the lower part of the hairs or along their shafts, a congeries of them sometimes being fastened to a single hair. In the course of from three to six days the young are hatched out, and are capable of reproduction in from eighteen to twenty days. Lice may occur in small or large numbers, depending upon the duration of the disease and the attention it has received. Pediculi capitis may be observed more particularly in the occipital region of the head. They are generally to be found on the heads of uncleanly children, especially of those who are poorly nourished; they are often thus spread through schools. They are also met with in adults, particularly among those who have long and thick hair, in which they find a most acceptable habitat. The parasites excite by their attack upon the scalp a greater or less amount of irritation, which causes itching and scratching, accompanied with wounding of the parts, an escape of serum and of bloody or purulent fluid, which together may dry into crusts and mat the hair. The itching may become almost intolerable, and the sufferer become so disturbed in both mind and body as to be affected in general health. When pediculi are present, of course the eggs or nits are to be found. They have the appearance of scales of seborrhea upon the hairs, but on close inspection are recognized as small, opaque, white bodies of globular form, which are attached closely to the hair shaft by a glue-like substance. They are found, in recent cases, usually near their roots, and in old cases near the extremities of the hairs. The ravages of lice depend upon the state of the patient's health and that of the scalp, being generally very severe in the neglected, the poorly nourished, and in those who are out of health. An eczema of the parts may be set up, by the irritation of the skin, especially in those predisposed to it, and may extend beyond the scalp forward to the forehead or back to the neck. The inflammatory action may at times be so severe as to occasion the adjoining lymphatic glands to become swollen and tender. In neglected and long-standing cases, the head, with its dirty, matted, twisted, and glued-together hairs, filled with decomposed pus, crusts, lice and nits, presents a most disgusting spectacle, and exhales an offensive odor. This is the explanation of the condition known as "Plica Polonica" in which the hair is matted into tangled masses.

The PEDICULUS CORPORIS, or body-louse, pediculus vestimenti, or clothes-louse, is larger than the head-louse, but otherwise resembles it. It is about two millimeters long and one millimeter broad, the female being larger and also more numerous than the males. The color of the parasite when not filled with blood is of a dirty white, grayish, or yellowish tint. In shape the female is elliptical; the head is acorn-like in form, with conspicuous eyes, and is furnished with two hairy, five-jointed antennæ. The thorax is square and plainly separated from the abdomen, and is provided on each side with three jointed, long, hairy legs with strong claws. In the female, the abdomen is broader than in the male, the sides being also more deeply serrated, and terminating in a triangular notch. The abdominal sections in the two sexes are less distinctive than in the case of the head-louse. The penis in the male is large and wedge-shaped, and projects from the middle of the abdomen. The domicile of the body-louse is the clothing covering the body, especially the seams and folds of the undergarments. It lives in the clothing, and frequents the integument only to obtain nourishment. In bad or neglected cases in which the lice are numerous, they may be seen drawing blood or wandering over the surface of the skin. The female lays, in the clothing, about seventy eggs, which mature in from four to eight days; and the progeny are capable of reproduction in from sixteen to eighteen days. Sometimes, by reason of the clothes having been changed, the only evidence of the disease may be the characteristic lesions which the lice make upon the skin. The peculiar injuries which they make are produced by the action of their haustella or suckers inserted in the follicles of the skin, developing hemorrhagic spots. A minute quantity of blood escapes from the follicle after the parasite has withdrawn its sucker, and the spot remains as the primary and characteristic evidence, by which alone the disease may often be detected without searching for the parasite. The parasites cause both by their movements and their attack upon the skin more or less unpleasant irritation. A burning, creeping, stinging, and unbearably itching sensation sets in, and the sufferer, seeking relief, indulges in scratching, that may lead to the development of excoriations, wheals, papules, pustules, crusts, pigmentations, and thickening of the skin. A striking picture of multiform lesions is thus often presented by patients attacked by the body-louse. The secondary manifestations may be especially varied, the scratch-marks being either short or long, superficial or deep; the excoriations, crusts, wheals, papules, pustules, and abscesses, of all sizes and forms. These lesions may likewise vary according to the duration of the disease and the condition of the patient's health. In some persons afflicted with the malady for a long time, more particularly in cases exacerbated by scratching, a brownish or blackish pigmentation results, and occasionally some thickening of the skin. Pediculosis corporis occurs most frequently in old persons, but it may also be met with in the young. The affection is very common in all countries among the uncleanly. The seat of the disease is chiefly about the neck, shoulders, clavicles, chest, back, and abdomen, but it often spreads over the whole surface. Upon the bodies of light-complexioned people, spots of a steel-gray or blue color are sometimes produced by body-lice. These marks vary from the size of a pea to that of the finger-nail, and are generally found upon the trunk, inner aspect of the thighs, and arms. They were produced experimentally by Duguet, who introduced into the skin a paste made by rubbing up the pediculi with water.

The Pediculus Pubis, or phthirius pubis, phthirius inguinals, morpio, or the crab-louse, usually attacks the pubic or the inguinal region, although it may also invade the eyebrows and eyelashes, the beard, the mons veneris, the anus, the axillæ, the sternal region, the thighs and abdomen, the scrotum, or, except the head, any part of the body supplied with hair. The crab-louse is smaller than the other species, the male measuring only one millimeter in length and six-tenths of a millimeter in breadth, and, as in the other species, it is smaller than the female. Its body is short, broad, and flat, and upon it is placed an oval-shaped head provided with two long five-jointed antennæ, and having a pair of small, hardly discernible eyes. The thorax and abdomen are united as one, and from the lateral part of the former project two pairs of six-jointed hairy legs furnished with claws, the first pair being relatively delicate and weak. The abdomen is heart-shaped, its margin slightly indented, and provided with eight short, conical feet that terminate in stout hairs. In color the insects are yellowish gray, and the somewhat transparent. They are, on account of their inactivity and transparency, very hard to detect in their nidus. The crab-lice are usually found with their heads well buried in the orifices of the follicles of the skin, with claws and bristles clinging closely to the hairs. Sometimes they are discovered crawling about the hairs or in close contact with the skin. Their ova are smaller than those of the head-louse, but are similar in color and firmly attached to the hairs, occasionally appearing like small pearls glued to the hairs, and are sometimes observed on the eyelashes. The excrement of the parasite may also be seen on the skin about the hairs, recognizable as minute, reddish particles. Crab-lice are more common at maturity than during adolescence. They are transmitted frequently through sexual intercourse, and may spread to other hairy parts of the body from the pubes. They may be acquired from using public water-closets. The insects may be communicated also by clothing or by bedding, and are thus sometimes transmitted to children. The amount of irritation or inflammation that they may occasion through scratching varies greatly, being severe in some persons, and slight or hardly perceptible in others.

**Diagnosis.**—The circumstance of intense itching without any distinct eruption should always raise suspicion of the presence of parasites and prompt search for them. If pediculi be present, they are readily detected, particularly when numerous. Sometimes, when only a few parasites are present, it is possible to overlook them unless the examination be most critical. Persistent search failing to reveal any trace of parasites, it may be concluded that, even if once present, they have been removed or destroyed. Yet, notwithstanding this conclusive test, cases do occasionally occur where persons are so imbued with pediculiphobia that, although free from the parasites, they still imagine them present. The diagnosis of the several varieties of the disease may be formulated as follows:

Pediculosis Capitis.—This disease is almost always detected by the presence of the parasites or of their nits. These are generally found at the top and back of the head, about the occipital region, associated with more or less secondary changes produced by the animals. They often thus set up an eczema of the scalp that masks the original ailment, but careful search for and detection of the lice or their nits may settle the primary cause of the disease. Occasionally it happens that a primary eczematous condition of the scalp has furnished a breeding-place for the pediculi. If the two conditions coexist, it is impossible at once to conclude which is the primary affection, especially in neglected children. The history, course, and the fact that pediculi frequently cause eczema, especially in the case of persons out of health, will usually serve to indicate which is the primary disease.

PEDICULOSIS CORPORIS.—Pediculi of the body are often overlooked if no parasites are discovered upon the skin. They are rarely found by examination of the skin, but should be searched for in the seams and folds of the underclothing, and especially the inner seams of the pantaloons. The existence of the minute hemorrhagic spots, with blood-crusts and excoriations made by the instrumentality of the finger-nails, especially around the shoulders, the clavicular region, and the back, are in most instances sufficient for a diagnosis. The differential diagnosis between pediculosis corporis and eczema, prurigo, paresthesia, and scabies, is indicated in the description of those affections.

PEDICULOSIS PUBIS.—Itching around the pubes, scrotum, mons veneris, anus, axillæ, and other hairy regions, except the scalp, should arouse suspicion and lead to a most careful examination of the parts. The detection of dark specks close to the hairs as they issue from the follicles, with sometimes small whitish or yellowish specks (nits), also in close contact with the hairs, should establish the diagnosis. Pediculosis pubis may be mistaken for eczema or paresthesia. The characteristic difference between them is pointed out under the description of the last disease.

**Etiology.**—Pediculosis is caused by the parasites just described. They may temporarily attack any person in any condition of life. Lice are more likely, however, to increase and multiply and occasion marked primary and secondary lesions on those surrounded by bad hygienic influences, who breathe foul air, drink impure water, do not bathe, and are poorly nourished, or in bad health. Pediculi, according to the most recent investigations, do not, as was at one time supposed, obtain their food with a mouth furnished with mandibles, but with a haustellum or sucker. This sucking apparatus is inserted in the follicle of the skin, through which the blood is drawn, leaving at the opening of the follicle a minute quantity that remains as the hemorrhagic spot previously described. It is the irritation set up by this act that leads to scratching with the finger-nails, and to local infection with the germs of suppuration and all the subsequent secondary changes.

**Treatment.**—It is necessary, in order to cure pediculosis, first to destroy the parasites and their ova; and, secondly, to remove all the changes which have been caused in the skin. Among the many remedies that may be employed for the former purpose are betanaphthol, the mercurials, tobacco, cocculus Indicus, staphisagria, sabadilla, pyrethrum, phenol and sulphur. These may be used either as powders, lotions, and ointments, and some even in the form of soaps. The ointment of the mercuric oleate I have found to be very efficient in the different forms of this affection, and with it may very suitably be combined one per cent. of picrotoxin. If the latter substance be added, however, care should be taken that the mixture is not brought into contact with an abraded surface. It is essential to add, in this connection, that in employing any remedial agent whatsoever the greatest personal cleanliness should be adopted or enforced. The debilitated and badly nourished, of course, need good food and tonics.

Pediculosis Capitis.—Betanaphthol and corrosive sublimate are most useful in destroying the parasites. The best means of employing these agents is by incorporating them with soap. Betanaphthol or corrosive-sublimate hard soap, used with water once or twice a day, is the most cleanly mode of removing pediculi. These preparations are pharmaceutically not only elegant, but they also aid in removing the crusts and other extraneous matter which may be on the scalp. The same drugs may also be used combined with soft or potash soap, if the latter do not prove too severe for the integument. Lotions and ointments of either betanaphthol or corrosive sublimate may likewise be used, but they are often objectionable on account of irritating the parts or matting the hairs. It is particularly for the last reason that, in treating pediculi of any hairy part of the body, lotions and oils are preferable to ointments. Infusions or tinctures of tobacco, or, of cocculus Indicus, may be used with advantage. The nits, should any remain, may be destroyed by solutions of soda, or borax. Vinegar, dilute acetic acid, and alcohol also serve well the same purpose. It is unnecessary to cut the hair either of children or adults, providing that cleanliness and any one of the remedies just named are persevered in until the parasites and their nits are thoroughly destroyed. Fine-tooth combs, which are much resorted to for removing the nits and crusts, should always be employed, if at all, with the greatest care. They are too often used carelessly, and excite inflammation of the scalp. If it be decided to employ an ointment, white precipitate, five to thirty grains (0.30 to 2 gm.) to the ounce (32 gm.) of fatty matter (or of sabadilla or staphisagria ointment) can be applied with benefit. Crude petroleum, or its refined preparation, kerosene, is also an efficient remedy for destroying pediculi. It may be rendered less inflammable and less disagreeable by mixing it with olive oil, or balsam of Peru. Its unpleasant odor is always perceptible, no matter with what the oil is combined. On account of its offensiveness and uncleanliness I have abandoned its use, and confine myself almost entirely to either betanaphthol or corrosive-sublimate soap. A five- to ten-per-cent. creolin-oil is an efficient antiparasitic, and the oil of rosemary and benzin, possess the same property. The tincture of larkspur (delphinium staphisagria) is a popular application to the scalp, but should be promptly washed from the surface with hot water. The powdered seeds mixed with hair powder have also been used for this purpose. Dr. Hugh M. Raven[1] recommends the following cheap, easy and efficient method, which is employed at St. Mary's Convalescent Home. "The hair is first combed and brushed to get rid of most of the lice. The brush is then dipped in a saucer full of oil of sassafras, and the whole head again well brushed, plaited, coiled, and a close-fitting linen cap put on. This is kept on for 24 hours and it practically never fails to destroy all the lice and the vitality of all the nits." If in the course of pediculosis eczema appears, it is to be treated in the manner referred to in the description of that disease.

Pediculosis Corporis.—As these pediculi and their ova harbor in the clothes and not on the body, it is necessary, as part of the procedure in treating an attack of the disease under consideration, to bake, boil, burn, or otherwise destroy the clothing that has been worn by the patient, if one would make perfectly sure of the extermination of the parasites. The underclothing should be continually subjected to examination, and be frequently changed. If this course be not pursued, it will be impossible to exterminate the parasites. Sometimes it may be impracticable at once either to sacrifice the clothing or to subject it to sanitary treatment, and in this event washing the skin with betanaphthol, or corrosive-sublimate, soap, or applying to it an ointment of thirty to sixty grains to the ounce of betanaphthol, white precipitate, or staphisagria, will keep the parasites from the person. The secondary effects of the attack of pediculi may be relieved by either weak mercurial or betanaphthol ointment, an alkaline or emollient bath, or a phenolized lotion of either oil or glycerin, applied to the parts.

Pediculosis Pubis.—After the presence of crab-lice has been recognized, they can be destroyed by any of the soaps, lotions, or ointments already suggested. Eczema resulting from the irritant action set up by the parasite is to be treated according to the conditions present.

**Prognosis.**—The disease, if properly managed, has a short duration.

Pediculi of the Lower Animals.—The smaller varieties of lice, or acari, peculiar to the lower animals, especially birds, may transfer themselves to the human body, occasioning either slight or severe irritation. Goldsmith reported the case of a woman who experienced intense itching, and after excessive sweating, a number of pigeon- or hen-lice were seen to come from the sweat-pores. Cleanliness, and the use of betanaphthol soap, a solution or ointment of betanaphthol, or corrosive sublimate, will effectually destroy these lice.

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[1] British Medical Journal, 1903.

## UNCINARIAL DERMATITIS.

SYNONYMS.—Mazzamorra (Sp.)—Ground itch.

An inflammation of the skin, notably of the feet, popularly known in the South as "ground-itch," has been frequently observed in persons, who subsequently suffered with the form of tropical anemia, connected with the presence of the uncinaria Americana, or "hook worm" in the intestines. The larvæ of this parasite are prevalent in the earth in some portions of our Southern States, and notably in Porto Rico.

**Symptoms.**—It is now known that these parasites penetrate the skin. Drs. Ashford and King,[1] of the United States Army, have reported the results of experimental production of this disease. Contact of the skin with mud known to contain encysted larvæ, for a few minutes (10 to 30), causes first, itching and redness, followed by swelling, and in the course of a few days by formation of papules which soon vesiculate. Secondary infection with pus organisms may lead to extensive and obstinate ulceration.

As E. C. Shattuck has recently pointed out, work on uncinariasis has only just begun, but the recognition of the cause of the condition and the systematic examination of the fecal discharges and skin lesions by the microscope, has already led to appropriate treatment, which has materially reduced the death rate during the past year. The importance of this work is made evident, by the recent report of the Permanent Commission for the Suppression of Uncinariasis, on "Anemia in Porto Rico," in which it is estimated that 90 per cent. of the population of the island suffer from this formidable scourge. The Commission treated 89,233 patients of whom 25.71 per cent. were cured; 17.88 per cent. were practically restored; and 40 per cent. remained under treatment. Less than one-quarter of one per cent. (0.31) died. Renal degeneration was found at the autopsies.

*Treatment* of uncinarial dermatitis is prophylactic and remedial. It has been shown that the wearing of protection on the feet, in the form of good shoes, will prevent the occurrence of infection. In the cases where this has already taken place, the lesion of erythematous, or eczematous character should never be neglected, but active antiseptic measures should be carried out to destroy the parasite, and prevent systemic infection by its entrance into the blood. Ointments of thymol have been recommended by Hardaway and Grindon. The parasiticidal effects of the x-rays might be employed for these patients. The remedies found useful in treating other local infections of the skin would probably be equally effective in this condition. After the antiseptic agent has been applied for a day or two, a plain, wet dressing of gauze may be applied, or a dusting powder used, or simply oxide of zinc ointment containing a little phenol (2 to 3 per cent.). The treatment adopted by the Commission consisted in the repeated administration of thymol and betanaphthol, preceded and followed by a saline. The oil of turpentine may be used locally.

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[1] Journal of the American Medical Association, Aug. 10, 1907, p. 471.

## CIMEX LECTULARIUS.

Synonyms.—**Acanthia lectualaria—Punaise des lits—Bettwänze—Bed-bug—Chinch bug.**

The bed-bug, a wingless insect belonging to the cimicidæ, is provided with a stinging and sucking apparatus, with which it obtains from man its ordinary sustenance, human blood, with which, however, it can dispense for long periods. It is small, nearly round, and depressed or flattened. In color, it is brownish-red, and on being crushed emits a rank and offensive odor. Its habitat is in beds, bed-clothing, wood, especially the cracks of floors, walls, behind wall-paper, and in old furniture. It may be found upon bats as a parasite. It tenants, in large numbers, old and neglected rooms and houses, especially those of people in the lower walks of life. The bite makes a hemorrhagic lesion, around which is produced an urticarial wheal. The skin in some persons being very sensitive, particularly in children, the effect of the bite of the insect is at once apparent, through the sensation of a pricking, itching, and burning feeling which stimulates scratching, whence, through the combined effects of the poison and infection of the abraded skin, secondary changes arise. There are, however, persons whose skin is in no wise irritated by the bite, the sole effect of which is the visible hemorrhagic lesion upon the part attacked. The cause of the disease having been ascertained, the wheals and other secondary changes can be at once relieved by applying to them soothing lotions or ointments. Four ounces (128 gm.) of camphor-water, containing half a drachm (2 gm.) of powdered borax; a solution of corrosive sublimate, two to four grains (0.12 to 0.24 gm.) to the ounce (32 gm.); a drachm (4 gm.) of boric acid, or half a drachm (2 gm.) of phenol to the pint (512 gm.) of water, are all effective applications. The official oxide of zinc ointment, combined with calomel, salicylic or boric acid, is likewise useful. The best agents to employ for banishing the insect from beds, floors, walls, and other places, is corrosive sublimate or betanaphthol, one or two drachms (4 or 8 gm.) of either to a pint (512 gm.) of water. All substances in which their presence is suspected should be washed thoroughly with one or another of the above-mentioned lotions every few days, until all signs of the insect disappear. The free application of kerosene oil is also very effective for bed steads. In institutions it has been found advantageous to paint the spring or wire mattresses, as it is easier then to keep them clean, and also to substitute iron bedsteads for wooden furniture. Visitors may bring in the bugs in their clothes.

It is possible that bed-bugs may act as carriers of infection. Recent researches into the etiology of leprosy, for instance, seem to establish the fact that this dread disease is communicable through the bites of insects; the assertion has been positively made that lepra bacilli have been found in the cimex lectularius, and the inference seems warranted that this biting insect is an active agent in spreading the disease.

## PULEX IRRITANS.

SYNONYMS.—Puce—Gemeiner floh—Flea of man.

This minute parasite, genus *Pulex*, order *Aphaniptera*, having powerful legs for jumping, is brownish-red in color, and is very common, especially in warm climates. It seeks the skin of man, and by its bite sometimes gives rise to very great annoyance. In piercing the skin the insect injects into it an irritating fluid, producing a small hemorrhagic point surrounded by an erythematous areola, characteristic of the flea-bite. A certain amount of irritation, with itching and the formation of wheals, may result. Flea-bites are sometimes so numerous and venomous as to simulate morbilli and scarlatina. The rapid subsidence of the hyperemic areola, together with the detection of the parasite, is sufficient to establish the diagnosis as that of simple flea-bites. They can generally be relieved by applications of alkaline tarry lotions, or solutions of betanaphthol, or of corrosive sublimate. In America, the flea of man is very rare, the dog flea, pulex caninis, taking its place. The rat-flea is of much importance in the etiology and spread of the plague. These varieties are only temporary parasites of man.

## PULEX PENETRANS.

SYNONYMS.—Rhynocoprion or sarcopsylla penetrans—Puce pénétrante—Chigre—Sand-floh—Sand-flea.

The sand-flea, known also as the chigre and jigger, is egg-shaped, brownish-red in color, and only half the size of the human flea. It is found in tropical countries, along the Pacific slope, and in the Southern States and Central America. The male is said to obtain its nourishment from any animal, man or beast. It is, however, only the fecundated female that burrows in the human skin developing a painful swelling with vesiculation or pustulation, which may, in neglected cases, produce ulceration, entail the loss of a member, or even result in death. Tetanus may result from this cause. The favorite point of attack is the feet, about the nail-bed of the toes. Its field of activity, as indicated by its name, is in sand, where children especially are open to its attack. The bite of the insect is at first hardly apparent, but as it soon becomes gorged and swells to the size of a pea, the lesion becomes particularly painful. Sweaty feet are notably exempt from its attack. The best preventive treatment is by good, substantial shoes and daily inspection of the feet. The essential oils, particularly the oil of wintergreen, are said to protect against attack. Radical treatment as popularly performed consists in extracting the insect with a hot needle, so as also to destroy the eggs. The slight resulting wound can be treated with any ordinary emollient or antiseptic dressing of moist gauze.

## DEMODEX FOLLICULORUM.

SYNONYMS.—Acarus folliculorum—Acare des follicules—Haarsackmilbe—Comedo worm.

This parasite, also termed steatozoön, or acarus folliculorum, lives in the sebaceous follicles of the majority of healthy persons. It was in 1841 discovered both by Henle and Simon. The acarus is a microscopic parasite of worm-like form, and, according to Wilson, who has given a most minute description of it, of a length varying from one sixty-fourth to one one hundred and thirty-fifth of an inch. It possesses a head, thorax, and an abdomen which is several times as large as the thorax, and terminates in a pointed extremity. Eight stout conical legs, all of the same size in the fully developed animal, and six in the young parasite, project from the thorax. Each leg has three articulations and terminates in three minute hooks.

The demodex of man is similar to, but not identical with, the variety that infests cats, dogs, mice, sheep, and others of the lower animals. The minute insect is discovered lying in a sebaceous follicle with the head directed inward. There may be from one to sixteen or more embedded in the same follicle, and they can be extracted without any difficulty. The contents of a follicle being squeezed out, and the product covered with a little oil and placed beneath the microscope, one is enabled readily to detect the parasites if present. The entozoön inhabits the nose, lips, chin, ears, back, and chest, subsisting upon the sebaceous substance of the follicle, and, according to Wilson and Geber, there is scarcely an adult upon whom they can not be found. They are met with in persons who have acne, comedo, and seborrhea oleosa, as well as in those who are perfectly healthy. They have never been known, except in the case mentioned by Remak, to have the effect of determining any other disease. Some observers have thought that pigmentation of the skin may be caused by this parasite. The variety found in the lower animals may cause abscesses and furuncles in dogs, mice and other animals; but these parasites are not transmissible to man.

## LEPTUS AUTUMNALIS.

SYNONYMS.—Rouget—Entemilbe—Harvest mite—Mower's bug.

There are two species of this insect in the United States—the leptus Americanus and the leptus irritans. They are minute red insects, visible to the naked eye. These mites, which are members of the family *Trombidæ*, have six long legs, the body of the leptus Americanus being pyriform, and that of the leptus irritans oval. The former, called harvest-tick, buries only the anterior part of the body in the skin, especially that of the scalp and axillæ, giving rise to the formation of a small papule. The body, engorged with blood, may be seen projecting from the surface of the skin as a reddish point, and is apt to be torn off by the nails in scratching. The latter, the irritating harvest-mite, which is of the two species more numerous in individuals, is found during the summer and autumn months in the fields, on the crops, on the grass, shrubs, and bushes, especially upon the blackberry and gooseberry bushes. The harvest-mite usually attacks the ankles and legs, causing the development of papules, vesicles, and sometimes pustules, and occasioning an intense itching. An examination of the lesion will generally show to the naked eye the reddish or yellowish-red insect buried in its centre. The diagnosis established, care should be taken to prevent any further invasion by the insects. The parasites perish in the skin in which they are buried in the course of a few hours or days, after which all symptoms disappear. The application of a weak beta-naphthol, sulphur, or mercurial ointment will generally give relief at once. Olive oil containing balsam of Peru, or phenol, or camphor may be applied, or spirits of camphor used to relieve the itching. A special variety of leptus known as "Americanus" has been discovered by Weyl and Geber, which in its larval form, attacks laborers in barley fields. It has four pairs of legs armed with hooked claws and haustellum disks on stems, and causes lesions by imbedding itself in the skin.

ERYTHEMA AUTUMNALE.—J. C. Thresh[1] says that this eruption on the skin is caused by a mite, which is parasitic on the harvest spider. This mite (rouget) is the hexapod larva of the *Trombidium holosericeum*. The initial erythema is often followed by an eruption of acuminate papules on the arm, neck, and chest. Irritating particles shed by the brown-tailed moth also cause erythema, in regions of the country where this insect prevails. It originally came from France.

## CYSTICERCUS CELLULOSÆ CUTIS.

The presence of the hydatid or cystic form of the tenia solium in the skin and subcutaneous tissue has been demonstrated and reported by many observers. It is more frequently met with in northern than in southern regions, and is especially common in northern Germany, where pork is used to a large extent, and is sometimes eaten not sufficiently cooked. The disease appears in the form of one or more cutaneous or subcutaneous tumors varying in size from a pea to a walnut. Fifty or more have in some cases been observed in the same individual. The development of multiple tumors is not simultaneous. If the cysticercus has perished, the tissue is generally shrunken and the tumor reduced to the minimum. If, on the contrary, the parasite is still living, the tumor is round or elliptical, smooth, and elastic, although firm to the touch. According to Cobbold, the parasite lives for about eight months, when it dies spontaneously and undergoes fatty and calcareous degeneration. In the course of time the tumor and its contents may be completely absorbed. In its early stage the hydatid occasions no subjective symptoms, but later, through increase in size, it may cause pain. Cysticerci of the skin generally occur in numbers on the back, the lateral parts of the trunk, and the extremities. They may, after reaching a certain size, remain unchanged for years, additional ones in the meantime cropping out. Finally, they may be accompanied by the development of cysticerci of the viscera, or after several years they may become obliterated in the skin or break down into abscesses.

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[1] Lancet, Nov. 10, 1906.

The diagnosis is readily made by the microscope. The parasite is in the shape of a globular sac, with a small head, which may project, but is usually withdrawn. It is armed with the usual four suckers, and a row of characteristic hooklets.

Cysticerci are sometimes met with in the skin, associated with others in the vitreous humor of the eye and in different parts of the brain. A case has been reported by a Russian observer in which they were also present in the heart and lungs. Hydatids may be confounded with syphilitic gumma, lipoma, sebaceous cyst, carcinoma, or sarcoma. If the tumor be opened and the contents examined by the microscope, the parasite can be readily detected and the diagnosis established. The scolex is contained in a vesicle which is filled with colorless fluid. The vesicle, in its turn, is lodged in a cyst composed of connective tissue. The treatment consists in carefully incising the tumor, scooping out its contents, and managing the wound upon general surgical principles.

The ECHINOCOCCUS, or the larval form of the dog tape-worm, has been found in the human skin in Europe, by Weyl and Geber. Tumors resulting from this cause resemble the preceding, but may become much larger.

## FILARIA MEDINENSIS.

SYNONYMS.—Dracontiasis—Guinea worm disease.

The Guinea-worm is a parasite that is found in tropical countries almost exclusively, especially in India, Africa, and Asia. It is found also in the Western hemisphere, in Guiana, Brazil, and the West Indies. The young worm, which is of microscopic size, enters the skin, as some authors state, by boring. It is held by others that the worm may be taken into the system through food and water, particularly the latter, and find its way to the skin through the circulation. The embryos of the dracunculus, or filaria medinensis, probably often obtain entrance by being swallowed in the drinking-water and subsequently penetrating the intestinal walls. It also enters the skin directly through abrasions, or when the skin is broken. Numerous instances of both means of ingress have been cited. The exposed feet and limbs are the parts generally attacked. Hyde declares that from merely walking upon grounds where the insect abounds, and bathing in infected water, it is impossible that attack can occur. After its introduction into man as well as the dog and horse, which it also attacks, the worm remains quiescent for months. At the end of that time, generally six months, it becomes mature, and comes to the surface, causing more or less systemic irritation, with some local pain, swelling, redness, and a boil-like tumor, which breaking exposes the head of the worm. The opening continues to enlarge until the worm with its embryos leaves the parts. In the course of some weeks a cicatrix forms in the place which it occupied. In other cases the lesion is a sinuous red line beneath the skin, which is slightly elevated by the worm. Death has been known to occur in consequence of prolonged suppuration, septicemia, pyemia, or tetanus. The fully formed worm is cylindrical, somewhat flat laterally, tapers toward both extremities, and is milky white in color. It is from one-tenth to one-twelfth of an inch in thickness, and from six inches to two or more feet in length. The female worm alone produces the disease.

The diagnosis is made by the discovery of the parasite. Only one worm occupies a swelling, but there may be present at the same time a number of tumors and worms in various parts.

The treatment recommended by Horton is large doses of asafetida, which assists in destroying the worm and in overcoming any tendency to inflammation and suppuration. Dr. Charles Forbes states that he has successfully employed small doses of precipitated sulphur. At the same time the head of the worm should be seized through the boil-like opening of the swelling, or through one made by an incision, and the whole animal be extracted as far as possible without breaking. If the whole can not be withdrawn, whatever length of it has been secured should be wound around a light piece of cardboard or wood fastened at the orifice. The winding of the worm should be attempted daily until the whole animal is extracted, which may require several weeks. Great care should be taken not to break the worm in the sore, because the part remaining would excite severe inflammation, accompanied by suppuration and lymphangitis. Dr. Emily recommends injections of a solution (1-1,000) of corrosive sublimate into the body of the worm in several places, and surrounding tissues. The worm is killed and may be removed the following day. T. H. Foulkes has in several instances successfully injected alcohol into the worm, causing it to harden and contract, thus facilitating its removal. A little fuchsin added to the alcohol will show by its color how far the latter has penetrated. Tincture of asafetida is also said to be effective as a parasiticide.

## MYIASIS.

SYNONYMS.—Myiasis œstruosa—Myiasis muscosa—Myiasis larvosa—Fly-blow disease.

The well-known disease of the lower animals caused by a deposit in the skin, of the eggs of the œstrus (the bot-fly or gad-fly, or allied species), is sometimes met with in man. It occurs especially among persons who sleep out of doors in regions where these flies are common. The lesions usually are developed upon uncovered parts such as the scalp, face, neck, hands, or feet. The symptoms may be serious. The fly lays its eggs in the subcutaneous cellular tissue, by means of a sharp ovipositor, particularly in August, causing a slight local irritation which soon passes off. When the eggs are hatched the larva penetrates more deeply by means of booklets upon its head and disappears entirely on account of its minute size (15x4 mm.). It requires about nine months for the larva to become fully developed, when it seeks to escape through the skin (now grown to be from 22 to 28 mm, in length, and 11 to 15 in breadth). When about six months have elapsed its presence is shown by a furuncle-like lesion of slow progress, which becomes more and more painful until the larva is finally expelled by ulceration, in the spring time.

In tropical countries there are species of flies that cause similar lesions to the œstrus, but the effects are more severe.

**Treatment.**—Early incision, with dressings of balsam of Peru, phenolized oil, or other parasiticides would be useful. Poulticing would aid in the expulsion of the worm, or larva.

M. Mucosa.—The *musca domestica* or house-fly, is not able to puncture the skin, but it may deposit its eggs or larvæ upon moist surfaces where secretions accumulate, or between folds of the skin, as well as upon wounds, ulcers or abrasions. The larvæ are commonly known as maggots. They may be removed by irrigation and by phenolized solutions.

The American blow-fly, *lucilia macillaria,* frequently deposits its larvæ on living animals, on open wounds, abrasions, the navel and also in the nostrils. They are sometimes met with in the human subject, especially in persons who sleep out of doors. The larvæ are easily recognized on the skin or in the discharges. Yount and Sudler have recently called attention to this condition and reported 23 cases occurring during a single summer. In man its results are serious and may be fatal, especially when the nasal sinuses are invaded. The worms cause ulceration and even necrosis or gangrene of neighboring structures. A chronic rhinitis, or unclean condition of the nose is a predisposing cause. Chloroform inhaled in the form of a spray causes expulsion of the parasites and is an effective method of treatment. Local irrigation with antiseptic solutions would naturally be indicated.

## LARVA MIGRANS.

Synonym.—Creeping eruption.

Among the parasitic affections which are seen in certain parts of Europe, but are very rare here, is a very peculiar one known as "creeping eruption," which has its special habitat in Russia and neighboring countries.

**Symptoms.**—A few cases have been reported in this country, by Van Harlingen, Stelwagen and Shelmire. The disease appears as a thin, red, serpiginous line, about an eighth of an inch in breadth, which extends in a nearly straight line. It grows at the rate of one inch or more a day. The line is slightly elevated, and its growth is accompanied by more or less itching according to the sensitiveness of the skin. Any part of the body may be affected, but it usually selects the extremities and extends towards the body. It has been observed among persons of not very cleanly habits, who are accustomed to walking with bare feet upon the sand at the sea shore.

**Etiology.**—The disease is caused by the presence of a wandering larva, which burrows from one point to another under the skin. It may be seen, in favorable cases, by pressing a piece of glass upon the lesion, and examining it with a lens; the insect is seen as a small black spot. It has been carefully described and its natural relations determined.

**Treatment.**—The treatment recommended is to place a drop of nitric acid, phenol or other caustic agent to the skin just in advance of the red line. It may also yield to repeated applications of iodine in strong alcoholic solution. Van Harlingen reported that in a case under his care "large doses of asafetida seemed to kill the parasite and put an end to the progress of the disease." Excision and cauterization are recommended. Stelwagen applied a solution of 1-1,000 mercuric chloride, which he drove into the skin by a galvanic current (electric cataphoresis). Freezing the advancing end of the line with ethyl chloride spray has been successfully used by Cathcart. Hutchens suggests the introduction of 1 or 2 drops of chloroform, by means of the hypodermic syringe, directly in the area occupied by the parasite. The x-rays might also be effective in destroying it.

## CULEX PIPIENS, GNAT, OR MOSQUITO.

Mosquitoes and gnats, which are plentiful in all parts of the United States, as they also are elsewhere, attack man in preference to the lower animals. Their bite occasions an itching which is sometimes most violent, especially in those persons having a sensitive skin, and gives rise to wheals. Immigrants from countries where the mosquito is but little known are, sometimes, in consequence of the wounds made by that insect, attacked by severe dermatitis, as reported, among others, by Dr. James Nevins Hyde. The demonstrated fact that infectious diseases, like yellow fever, and malaria, are communicated by certain varieties of mosquitoes, makes it important to prevent their bites, by careful screening of doors and windows in infested localities.

**Treatment.**—The irritation may be relieved by ammonia-water, spirit of camphor, peppermint-water, or lotions of corrosive sublimate, beta-naphthol, or borax. A drachm or two (4 or 8 gm.) of boric acid, in four ounces (128 gm.) of peppermint or camphor water often acts promptly in relieving the irritation. Several useful prescriptions may be found in the formulary at the end of this section, for the treatment of bites and stings of insects.

## IXODES, WOOD-TICK, WOOD-BEETLE.

There are several species of ticks that invade the skin of man and the lower animals. They are met with in woods, on pines and bushes. The female of any of these species attacks the skin, imperceptibly inserts her proboscis, and gorges herself until the body swells to the size of a pea, or larger. Any forcible attempt at this time to extract the insect is liable to result in breaking off the proboscis, which, remaining in the skin, often occasions considerable inflammation and great pain. Rather than incur this penalty, it would be better to wait until the parasite has become gorged and drops off. But its discomfiture may, without waiting, be speedily accomplished by applying to it an oily substance, such as oil of turpentine, benzin, or tobacco-juice, which compels it to retract the proboscis and let go its hold on the skin.

There are numerous larger insects, as barley-mites, midgets, flies, ants, bees, wasps, leeches, caterpillars, centipedes, and spiders, which, by their bites and stings, and in some cases even by their contact, may excite wheals, papules, pustules, hemorrhagic spots, or even severe inflammatory action. Death even has been known to result from the sting of a bee. Insects often drop upon and attack persons sitting under trees or on the grass during the spring and summer months, causing, as I have observed, various kinds of lesions that occasion at times a most violent itching or severe inflammation of the skin. The bites of the *Dermacentor Reticulatus* cause the general febrile affection known as Rocky Mountain fever.

Some species of spiders found in tropical and sub-tropical countries are so venomous as to produce serious tetanic or narcotic symptoms. Dr. T. W. Schaefer, of Kansas City, has pointed out that a poisoned wound is caused by the *Belostoma Americana* or *B. griseus*, the so-called "electric-light bug." The bites of human beings are apt to be followed by very serious symptoms, and sometimes by death. Sternberg has shown that human saliva is fatal to rabbits, when administered hypodermically. It always contains pathogenic organisms, which may be virulent. Among the bad effects of the human bite, Dr. Soriano, of Mexico, enumerates phlegmon and erysipelas, with destruction of tendons, or aponeuroses. Recovery is slow and painful. Deep incisions are required, especially when the aponeurosis is wounded. The membrane itself should be divided. It becomes necessary sometimes to amputate a member, as a finger, toe, hand, or foot, in order to save life. Irritation from the contact of the brown-tail moth, and the hairs of certain caterpillars, will produce severe irritation, erythema, or eczema, more marked in patients with sensitive skins, or who have a special susceptibility.

The treatment of the effects of bites and stings inflicted by ordinary parasites is to be managed upon general principles. A soothing ointment or lotion is usually required. The pain that may follow the sting or bite may be relieved at once by almost any alkali, ammonia-water being one of the very best; and a lotion of permanganate of potassium is excellent. Beta-naphthol, corrosive sublimate, and borax lotions and ointments, are also efficacious. Dr. Phillipe Ricord, of Newark, instances a case in which he was able to employ a spray of hydrogen dioxide to the sting of a hornet directly after it was received. The pain ceased at once and the swelling rapidly disappeared. A raw onion, bruised and applied to the wound caused by such bites and stings, is an excellent household remedy and moist clay is another.

# *VEGETABLE PARASITES.*

## TINEA VERSICOLOR.

SYNONYMS.—Pityriasis versicolor—Chromophytosis—Kleienflechte.

TINEA[1] VERSICOLOR is a vegetable parasitic, cutaneous disease, arising from the presence in the skin of the microsporon furfur, and characterized by the development of yellowish, reddish, or brownish furfuraceous patches of various shapes and sizes upon the cutaneous surface.

**Symptoms.**—The parasite of tinea versicolor does not attack the hair or nails, and only superficially involves the epidermis. It manifests its presence by yellowish, reddish, brownish, and in exceptional cases blackish, irregularly shaped, furfuraceous macules, or patches, of various sizes. Tinea versicolor occurs most frequently between the twentieth and fortieth years, but may appear at any age. The disease usually first develops as small, round or oval, erythematous or yellowish spots slightly elevated above the surface. The patches are usually situated upon the chest or shoulders, and may be upon the abdomen, back, arms, and thighs, but never appear upon the face or hands. They vary exceedingly in number and color as well as in size and shape. In some cases they are few and isolated, not exceeding half an inch in area, but in other cases they are so numerous as almost to cover the entire surface of the chest and abdomen. The lesions increase in size by peripheral extension, and frequently coalesce to form large, irregular patches. They are, when first observed, usually reddish or yellow, but may be of any shade from light yellow to dark brown. In a remarkable case observed by Tilbury Fox, the patient, who was from a tropical climate, was covered on the back and sides with black, desquamating patches, which, upon microscopical examination, were found to be patches of tinea versicolor. Dr. George Dock has reported a similar case in a man who had never lived in a warmer latitude than that of Michigan. In general, however, the lesions are of that peculiar fawn-colored cast which the French describe as *"café au lait."* Tinea versicolor never produces constitutional symptoms, and is not accompanied by any marked subjective phenomena. The skin upon which the eruption is situated may become congested or irritated, and may assume an eczematous or urticaria-like appearance, but this is a rare occurrence. The scales may be abundant, or loose, scanty, and adherent. They are very fine, and of a branny appearance, and can readily be detached by rubbing or scraping. Their amount varies with the cleanliness of the patient, being always less after bathing. If not thus removed, but allowed to accumulate, there results a dusty, rough appearance, readily removed by friction. When the skin is bathed with perspiration, they form a mealy paste, or shape themselves in the folds of the skin into pasty rolls. The eruption causes in stout persons, and in those who perspire freely, more or less annoyance from itching. The itching is, however, in many cases absent or so insignificant that the disease is not suspected until the eruption is accidentally detected. Thus, White very rationally explains its more frequent discovery in phthisical patients than in others by the circumstance of its revelation incidentally to examining the chest of those persons for a different specific purpose. The disease has a tendency to invade the surrounding epidermis, and when removed it is very apt to reappear. In many cases it regularly appears after the winter months have passed away, and at that period readily yields to treatment in a few weeks, reappearing at about the same time in the following year. Patients are occasionally met with who have had these periodic returns of the disease for twenty or more years. It is rarely or never observed in children, and is equally rare in persons over fifty or sixty years of age. The course of tinea versicolor is steadily progressive. If untreated, the affection may last for many years, but it does not in some cases spread with the same rapidity or invade so large a surface as in others. According to my experience, tinea versicolor occurs more frequently in persons with a harsh skin than in those whose integument is soft and delicate. It attacks either sex.

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[1] Tinea, in Latin a moth or a worm, has been adopted as a generic name for diseases of a vegetable parasitic origin.

**Diagnosis.**—While the diagnosis of tinea versicolor may be said to be comparatively easy, nevertheless there are quite a number of affections simulating it. A collation of its symptoms, therefore, will constitute the best means of differentiating the disease. The principal features of the eruption to be remembered are its usual location on the chest and sides; the absence of the eruption on parts exposed to the light; its peculiar brownish or fawn color (the "*café au lait*" tint of the French); the slight elevation of the spots or patches; their occasional erythematous tendency, especially during the heated period; and their desquamative character. The last-mentioned point especially should form the salient feature for diagnostic purposes, and, if combined with microscopic examination, will leave little doubt as to the character of the disease. The spots may at times assume the character of wheals resembling those of ***urticaria***, but no scales are present in the latter affection. In persons who perspire freely the spots may present a punctated appearance, with elevated and inflamed papillæ simulating the eruption of *eczema*; but eczema is accompanied by more intense itching and burning symptoms than this affection, and rarely appears upon the regions usually involved in tinea versicolor. The character of the scaling is also different in the two diseases. The resemblance between the patches of tinea versicolor and the lesions of *chloasma*, *vitiligo*, *lentigo*, and the *macular syphilides*, is only superficial. *Chloasma* consists of a more or less diffused pigmentation of the mucous layer of the epidermis, while tinea versicolor is an affection of the horny layer. The patches of the former are smooth and not elevated, while those of the latter are elevated and composed of fine furfuraceous scales. The regions involved in the two diseases are also different. Chloasma occurs frequently on the face—a region that is rarely invaded by tinea versicolor.

*Circumscribed* and *diffused pigmentation* may result from inflammatory eruptions and cutaneous irritations, and may remain after blisters, but the history and the absence of scales will decide the diagnosis. *Vitiligo* can not well be confounded with tinea versicolor, for the circumscribed areas in the former are white, but discolored in the latter. The borders of the patches in vitiligo are more or less pigmented, smooth and altogether unlike the elevated scaly patches of tinea versicolor. *Freckles* (lentigo) are of the same nature as chloasma, differing from it only in their size. They may present a superficial resemblance to tinea versicolor in its macular stage, but they have no scales, and they are principally observed upon the face and hands, where the parasite of tinea versicolor is known not to thrive. *Syphilitic macules* may prove perplexing in the diagnosis, and may give rise to confounding the two diseases. The color of syphilitic eruptions is, however, never so decidedly yellow as that of tinea versicolor. The eruptions of syphilis show besides neither elevation nor desquamation. They are of a coppery hue, and an examination always develops a history of infection. The lesions also are not limited to the chest, but may appear upon any portion of the body. They are usually small in size, circular in form, and unaccompanied by itching. Other manifestations of syphilis, too, are usually present at the same time. The existence of syphilis in a patient affected by tinea versicolor may, it is true, lead to some doubt as to the nature of the latter eruption, but the presence of scales will point to the correct diagnosis, which the microscope will confirm with unerring certainty.

**Pathology.**—The lesions of tinea versicolor are largely composed of the spores and mycelium of the microsporon furfur. This parasite ramifies through the superficial layers of the stratum corneum, but does not penetrate the rete mucosum nor attack the hairs or nails. The mycelial threads appear to be inextricably woven throughout the epidermic scales. The spores manifest a tendency to cluster. If the scales be detached from a spot and placed in a drop of liquor potassæ, and then examined with a microscope having a power of five hundred diameters, the mycelial threads will be seen to form an intricate network of straight and looped, entangled and braided, crossed, curved, and serpentine lines. The threads vary in diameter from .0015 mm. to .0036 mm., and frequently terminate in spores. Spores, both isolated and in clusters, may also be observed in the field, are round, irregular, or oval in shape, and vary from .0023 mm. to .0084 mm. in diameter. They are at times nucleated, and are highly refractive. They may be developed from the mycelium or from pre-existing spores by a process of cell-division.

**Etiology.**—Tinea versicolor is caused solely by the presence on the skin of the vegetable parasite known as the microsporon furfur. The parasitic nature of this disease was discovered by Eichstadt, of Griefswald, in 1846. It is contagious only under very exceptional circumstances and to a very mild degree. The manner in which the parasite is conveyed to the skin is unknown. It is probable, however, that the spores are wafted about in the atmosphere, and thence deposited on the patient's clothing, or that they are contained in the water in which the clothing is washed, and so conveyed to the skin. It is thought that the parasite attaches itself particularly to flannel underwear and is thus often indirectly transmitted. Tinea versicolor may appear in either sex, in the rich as well as the poor, in persons who bathe frequently as well as those who are careless in that respect, and in the robust as well as in the weak. It is especially liable to attack consumptives. The skin of certain subjects seems to afford a particularly favorable soil for the development of the parasite.

**Treatment.**—The importance of treatment has always been underestimated, and the consequence has been either incomplete or total failure in the cure of the disease. Thus, the French have considered the treatment of this affection to be simple, and have thought the preparations of sulphur quite sufficient to effect a cure. Hardy recommends them either in the form of baths or ointments. He says, further, that the acid nitrate-of-mercury ointment produces the same effect; also that the parasite disappears equally well by applying lotions of corrosive sublimate or by the use of mercurial baths, and that only a few cases are not amenable to this treatment. The Germans seem to think that cleanliness is about all that is required to effect a cure. They recommend change of underclothing and daily ablutions with soap and water, under which treatment it is asserted that a gradual cure is effected. When, however, it is necessary to proceed more rapidly, it is alleged that an application of green soap, left on the skin for several days, is quite sufficient to produce a cure. The method of the late Tilbury Fox was to wash the surface with yellow soap and then sponge it with vinegar and water, after which he applied a solution of six drachms (24 gm.) of sodium thiosulphate in six ounces (192 gm.) of water. In obstinate cases, a bath of sodium thiosulphate is serviceable. Tilbury Fox's idea was to get rid of the greasy matter of the skin with soap, and then to continue the use of the antiparasitic agent until every trace of the disease had vanished. Balmanno Squire uses a more extended treatment, as follows: The patient first thoroughly soaps the affected skin; afterward takes a warm bath, and, as soon as he has dried himself, scrubs the discolored surface with a flesh-brush. He then, every day, rubs well in over every patch a weak mercurial ointment. The plan first described has, he asserts, the following advantage: The epidermis is so thoroughly softened, that, by rubbing, the more superficial portions of the fungus are readily detached, and the more deeply seated portions are exposed to the direct action of the remedy. By this process, patches that have existed for many years may be completely removed in about a week. Balmanno Squire also uses an ointment of precipitated sulphur, increasing its effects by the addition of a small quantity of hepar sulphuris (Potassa sulphurata, U. S. P., 1890). He also mentions using a twenty-per-cent. ointment of chrysarobin. Startin recommends washing the skin with solutions of sodium thiosulphate, a drachm (4 gm.) to the ounce (32 gm.); sulphurous acid, two drachms (8 gm.) to the ounce; mercuric bichloride, two grains (0.12 gm.) to the ounce (32 gm.); any one of them to be employed two or three times a day, followed by the application of an ointment of white precipitate, hydrargyrum ammoniatum, thirty grains (2 gm.) to the ounce (32 gm.)

The author's experience, in private and hospital practice, has led him to view a radical cure of tinea versicolor as not quite so easy of accomplishment as might be inferred from the light manner in which writers refer to the subject. Patients, usually after an apparent cure, wander from one physician to another for treatment, although the usual remedies had been again and again persistently applied without entirely removing all the patches of the disease. Persons decidedly anemic, phthisical, or cachectic, who are predisposed to the disease, improve more rapidly when constitutional and external remedies are both employed. The principal treatment must, of course, be local. The following prescriptions will be found to be most serviceable. The affected part may be sponged night and morning with either of these lotions:

| | | | | |
|---|---|---|---|---|
| ℞ | Sodii boratis ........................ | ʒiij. | 12. | |
| | Aquæ hamamelidis dest. ............. | f℥v. | 160. | M. |

| | | | | |
|---|---|---|---|---|
| ℞ | Thymol ............................ | ʒss. | 2. | |
| | Spiritus vini rect. .................. | f℥j. | 32. | |
| | Glycerini ........................... | f℥ij. | 64. | M. |

Either of these preparations will keep the spots clean, remove all the sebaceous deposits from the surface, and act at the same time as a mild antiparasitic. After this treatment has been carried out for a few days, and the epidermic scales thus softened have become detached, a stronger antiparasitic may be applied. The most effective remedy for this purpose is the oleate of copper, either diluted with oleic acid or made into a soft ointment, a ten- to a twenty-per-cent. with lard. The salts of copper, since my experiments with the oleates, have been admitted to possess marked antiseptic and antiparasitic properties. The oleate of copper admits of the most simple and thorough application. It not only destroys the parasite on the surface, but by a deeply penetrating action arrests its development in the interstices of the epidermic cells. No parasitic skin-disease yields so readily to any one remedy as tinea versicolor will, as the rule, to the copper oleate. The author has succeeded with it in relieving and permanently curing many obstinate cases of the disease. In applying this oleate it should always be borne in mind that a very small quantity is sufficient to go over the diseased surface. The oleate will rapidly penetrate the skin, and a large amount smeared upon the surface will merely discolor the linen without being of any additional service. I would in all cases advise that the lotions which have here been recommended should be used instead of water to keep the parts clean, thus preventing the spreading of the parasite. In tinea versicolor, and all other vegetable parasitic diseases, the fungi propagate themselves more rapidly when water is used on the parts. The author therefore in all cases prohibits the use of water on the regions affected by the parasite, and depends for cleanliness upon the application of the lotions previously mentioned. This treatment should be continued until discoloration and scales are no longer noticeable and a new and healthy surface has formed. Dr. Joseph Drzewiecki, of Warsaw, Poland, writes[1] that he has for years been in the habit of advising persons afflicted with any chronic pulmonary complaint to rub the chest night and morning with a cloth-brush. This circumstance led him to notice that when tinea versicolor happened to be present it disappeared in ten days or two weeks. The result took place even in those whose skin was dry, in which case it became smooth, shining, and elastic. The practice of Dr. Mansurow, of Moscow, is to apply charta picis to patches of tinea versicolor. He reports that on removing the paper at the end of six days the skin is perfectly normal. The epidermis adheres to the paper when removed, and the fungus is embedded in the pitch.

Small patches have been successfully treated by the application of the tincture of iodine. Among other remedies which may be employed are betanaphthol, boric acid, resorcin, phenol, or chrysarobin ointment, a one-per-cent. ointment of picrotoxin, creolin, and a fifteen-per-cent. solution of chloral hydrate. The author removes the patches sometimes by the daily application with friction of alcohol, or alcohol with boric acid or betanaphthol.

**Prognosis.**—Tinea versicolor is usually a trivial affection, although it sometimes gives rise to a great deal of annoyance to the patient. It yields with readiness to treatment faithfully carried out. It is apt to reappear if the parasite be not thoroughly eradicated. As a general rule, two or three weeks suffice to bring the disease to a conclusion, but relapses may occur. When the cure is complete, it may be advisable for the patient to discard his former underclothing and wear new ones, which have not been washed.

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[1] Satellite, September, 1889.

## TINEA FAVOSA.

Synonyms.—**Favus—Porrigo favosa—Dermatomycosis favosa—Erbgrind—Teigne faveuse—Crusted ringworm—Honey-comb ringworm.**

Tinea favosa is a contagious vegetable parasitic disease produced by the achorion Schönleinii, and characterized by the development of a number of small, round or oval, cup-shaped, pale-yellow, brittle crusts, which are usually situated over the hair-follicles, and perforated by hairs. Their resemblance to a honey-comb has suggested the specific name, favus—a honey-comb.

**Symptoms.**—Favus may be limited to the hairs and the hair-follicles (tinea favosa pilaris), to the epidermis (tinea favosa epidermis), to the nails (tinea favosa unguium or favic onychomycosis), or it may involve the entire surface and all of the cutaneous appendages (tinea favosa universalis). Occasionally the mucous surfaces are also invaded. In a case of the latter character, observed by Kundrat and reported to the Vienna Imperial and Royal Society of Physicians, the fungi had been conveyed from the patient's fingers to his food, and then into his stomach, where they had invaded the mucous membrane, developing the characteristic cup-shaped crusts, producing uncontrollable vomiting and diarrhea (gastritis favosa), that soon resulted fatally. Favus usually appears first upon the scalp, but it may develop upon any portion of the body. It is not infrequently met with upon the face and neck. The disease generally develops as a circumscribed, superficial inflammation of the skin, accompanied by slight desquamation and more or less itching. The affected surface is reddened, covered with minute scales, and may be the seat of a minute vesicular eruption. In a few days several small, bright-yellow bodies may be observed in the hair-follicles. They are depressed beneath the surrounding epidermis, and are perforated by hairs. These favoid bodies are fungous masses that proliferate in the hair-follicles, surround and penetrate the hair-shaft, and insinuate themselves between the upper layers of the epidermis, where they ramify in all directions. They ultimately attain the size of a split pea or that of a small bean, and then appear as pale-yellow or sulphur-colored cup-shaped crusts situated in and around the hair-follicles. The crusts are umbilicated, and perforated by one or more hairs. Their margins are slightly elevated above the surrounding surface. The lesions consist of a series of concentric layers closely packed together. They are isolated at first, but sooner or later coalesce so as to form large, elevated crusts, in which the circular forms of the component favus cups may be recognized for some length of time. The crusts gradually become dry and brittle, and change in color from light-yellow to a dirty gray or mortar-like hue. The *scutula,* as they are otherwise called, increase in size and become rough and irregular in shape, and are frequently surrounded by an inflammatory areola. They vary in number and size, and are situated upon a depressed, reddened, and more or less atrophied surface, from which they can be removed without much difficulty. The itching to which the affection gives rise is sometimes so intense that the patient is unable to refrain from violent scratching. This is productive of various complications—the disease is spread over a larger area than before, or conveyed to the finger-nails, or a severe eczematous inflammation terminating in the formation of pustules may ensue.

The hairs in the affected area soon become involved, their growth being impaired; they lose their normal glossy appearance and become dry, dull, and brittle, and finally fall out. The loss of hair is due to atrophy of the hair-papillæ and hair-follicles from the pressure of the crusts, and is apt to be permanent. Favus of the body and extremities is characterized by the development of discrete sulphur-colored scutula or cup-shaped crusts at various points upon the surface. The disease not infrequently disappears spontaneously in a few weeks or months by the dropping off of the *scutula,* as the follicles of the downy hairs are too shallow to admit of an extensive proliferation of the parasite. In some cases, however, the disease may remain for years. The author has seen the case of a boy nine years old in which the scalp, face, body, and limbs were involved. The disease had persisted without abatement for four years. The patient, however, was of scrofulous diathesis, and had been poorly fed and badly clothed. All of his surroundings were of the most depressing character, and appeared to combine to render his integument a fertile soil for the proliferation of the fungus. In Kundrat's case the entire surface was affected. Abscesses formed in the thighs, and death finally resulted from severe gastro-intestinal disturbance marked by uncontrollable vomiting and diarrhea. At the post-mortem examination numerous erosions and diphtheritic swellings were found on the gastric mucous membrane, and the intestines contained a quantity of foul, putrescent material mixed with mucus. Kundrat at once declared that the swellings were due to the favus fungi, and the microscope confirmed his assertion. It is probable, however, that the gastric mucosa was previously unhealthy, or it would not have furnished a suitable nidus for the parasite. Favus of the nails (tinea favosa unguium) is a rare affection, and is usually secondary to favus of the scalp or some other region of the body. It appears at first as small, light-yellow or sulphur-colored deposits in the substance of the nail, which increase in size and produce more or less thickening and other changes from defective nutrition. The nails finally become soft or brittle, and undergo a sort of cheesy degeneration. Favus of the nails is an obstinate form of the disease.

Favus is accompanied by a peculiar odor which is difficult to describe, but which when once experienced can never be forgotten. It is similar to that of moldy straw, and has been characterized as "mice-smell," which, by the way, is really not the odor of mice but of their urine. Favus of the scalp may appear in the form of red, scaly rings, simulating tinea tonsurans, but on close examination the characteristic *scutula* or cup-shaped crusts will be found embedded in the outer rings.

**Diagnosis.**—The diagnosis of favus can usually be made without much difficulty. The characteristic yellow, friable, cup-shaped crusts, with their peculiar odor of mice, are not found in any other disease. When the eruption has existed for some time, however, and the crusts become broken down, or when an eczematous inflammation has developed around them from excessive scratching, the nature of the case may be somewhat obscured. In *simple eczema,* however, the crusts are brownish in color, not yellowish, and are situated upon an excoriated base; there is no mice-smell, and the hairs are not affected. The reddened furfuraceous appearance of the skin in the early stages of favus is not unlike that which is observed in *psoriasis,* but the appearance of the yellow favoid bodies reveals the true character of the former disease. L. Duncan Bulkely[1] mentions a case of favus of the cheek, which had been sent to him as a case of *epithelioma. Tinea tonsurans,* when accompanied by suppuration and pustulation, might be mistaken for favus. The resemblance, however, is only superficial. In tinea tonsurans the hairs present a nibbled or broken-off appearance, whereas in favus they are unchanged in length, and drop out of the follicles. As pointed out by Behrend and Duckworth, if a hair affected by the trichophyton (the parasite of tinea tonsurans) be moistened with chloroform, it will turn white in two or three minutes; while, under the same test, normal hair, or the hair from a patch of favus, will not exhibit any change whatever. *Tinea circinata* has been confounded with favus, but the symptoms and course of the two affections are so widely different that the error should not be made. In all doubtful cases a hair from the suspected patch or a portion of the crust, or from the epidermis, should be placed in a solution of caustic potash and examined microscopically for the achorion Schönleinii. A microscopic power of from two hundred and fifty to five hundred diameters will be necessary to make the characteristic features of the parasite plainly visible.

**Pathology.**—Favus may affect the hairs and nails as well as the hair-follicles and the adjacent epidermis, but the latter is chiefly involved. The crusts are composed almost entirely of the mycelium and spores of the achorion Schönleinii. The mycelium consists of narrow, flattened threads or tubes ramifying luxuriantly in all directions. They are pale green or gray in color, and vary in diameter from .0023 mm. to .0028 mm. There are two varieties of mycelial tubes or threads—those which are apparently empty, and those which are divided into small compartments containing numerous granules or young spores. The fully developed conidia or spores are round or oval bodies, varying in diameter from .0023 mm. to .0051 mm. They are present in great numbers, and are frequently massed in groups. Forms intermediate between spores and mycelium may also be observed.

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[1] Therapeutic Gazette, Oct. 15, 1907, p. 681.

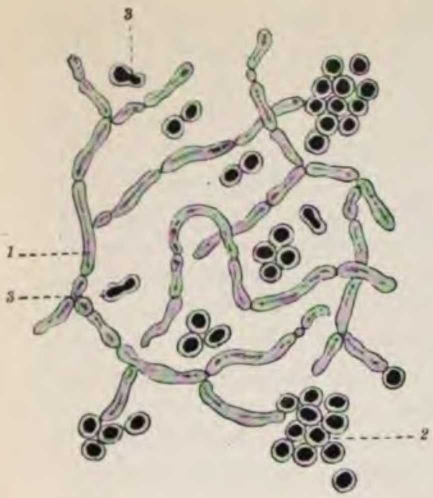
The parasite penetrates into the hair-follicles, and insinuates itself between the superficial cells of the corneous layer. It also attacks the inner and outer root-sheaths of the hair, and may even invade the hair-shaft. Obliteration of the hair-follicles and atrophy of the hair-papillæ finally result from the continuous pressure of the parasitic growth. Various inflammatory and atrophic changes take place in the corium from the same cause. Suppuration and permanent cicatricial depressions may or may not occur. In tinea favosa unguium, mycelium and spores are found in the nail-substance and in the nail-bed, and are ultimately productive of various degenerative changes.

The favus fungus has of late been further studied by Quincke, Elsenberg, and Favre, but their results do not completely accord. Three forms, designated respectively as $\alpha$, $\beta$, and $\gamma$, were indicated by Quincke, who regards the $\alpha$, as the true favus fungus. The material of Elsenberg's investigations was collected from twenty-seven individuals, and cultivations were made upon bouillon, nutritive gelatine, serum, and agar-agar. He detected but two varieties, of which Variety 1 resembled Quincke's $\alpha$, but differed in its behavior under cultivation. Elsenberg's Variety 2 corresponded neither to the $\beta$ nor $\gamma$ of Quincke, but it was always present, and differed but little from his Variety 1. He therefore concludes that his two varieties are different forms of one fungus. In Favre's experiments the favus lesion was removed at a very early stage of its development, as soon as it was visible to the naked eye, or by the aid of the microscope. In a pure culture the fungus corresponds to Quincke's $\gamma$ form. Inoculation of this culture upon the author's arm produced favus. The manifestation was preceded for some days by herpetic vesicles, which could not be distinguished from those of trichophytosis. He could not find the $\alpha$ fungus. Quincke has asserted that his $\gamma$ form was never present in herpetic favus. Favre considers it probable that the $\gamma$ fungus is the cause of favus.

More recently Unna has recognized three varieties or species of the fungus, and connected them with differences regarding the color, consistency, and other properties of the crusts. These views have been denied by other experimenters, and are by no means universally accepted.

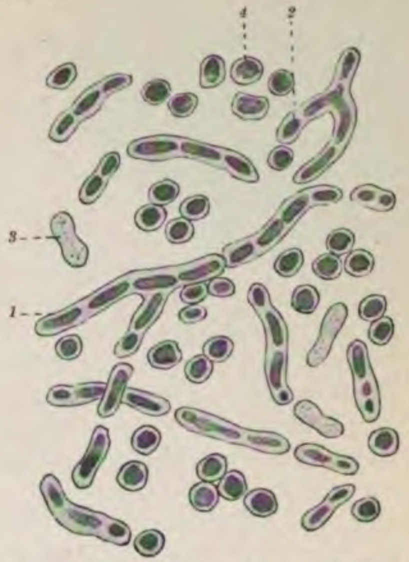
**Etiology.**—Favus is produced by the growth of the achorion Schönleinii, a vegetable parasite attacking the follicles, the nails, and the upper

PLATE XXVII



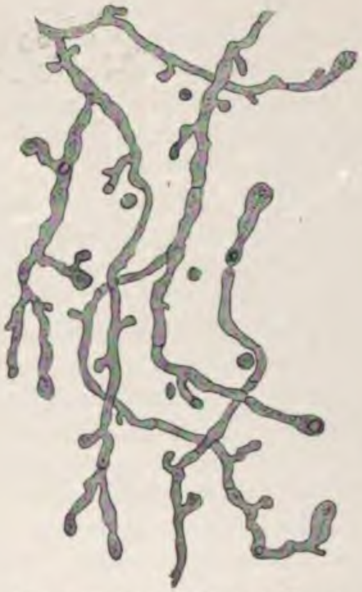
Microsporon Furfur from Scales of Pityriasis-versicolor, Soaked in Potash Solution.
(See page 847)

1. Mycelium of branching threads.
2. Spores regular in size and shape.
3. A budding spore.



Achorion Schönleinii from a Piece of a Scutulum of Favus, Soaked in Potash Solution.
(See page 854)

1. Mycelium of flat, branching, truncated filaments.
2. Filament split up by transverse septa.
3. Empty filament.
4. Spores.



Achorion Schönleinii of Favus.
(See page 854)

corneous layers of the epidermis, and is propagated by contagion. It is exceedingly common in the lower animals, especially in cats, mice, and rabbits, and is frequently communicated by them to man. Often, however, no history of direct contagion can be established; in these cases it is probable that the spores of the fungus were transferred through the medium of the atmosphere.

Favus may occur at any age, and among the rich as well as the poor. It is met with most frequently, however, in childhood, and among scrofulous and debilitated subjects. The susceptibility of individuals to its contagion varies greatly. It is probable that a pathologic condition of the integument is necessary to its continued existence.

**Treatment.**—Constitutional measures are often very advantageous in the treatment of favus, especially in debilitated subjects and in those of a syphilitic or scrofulous diathesis. For patients of the latter class I know of no better remedies than codliver oil administered in combination with the syrup of the iodide of iron, or small doses of potassium chlorate administered in water after meals. Nourishing food, fresh air, and healthful exercise are also of paramount importance.

The parasite can be destroyed, however, only by thorough and persistent local treatment. In reviewing the measures advocated by various writers, it does not appear that much improvement has been made upon the methods of the Frères Mahon. Epilation, so universally recommended, can not be claimed to be in conformity with modern therapeutics. It is injurious to the hair-follicles and painful to the patient, and should be discarded as a relic of medical barbarism of the last century.

The first object to be accomplished is the removal of the crusts, after which an antiparasitic should be applied to destroy the fungi on the surface as well as in the hairs and hair-follicles. The best means for removing the firm crusts is by the application of oil, which softens and loosens them. The oil of ergot will be found the most effective, as it softens and produces also a mild astringent effect upon the epidermis. The olive, almond, and phenolized oils possess, in a much less degree, properties suitable for the same effect. The crusts and the surrounding epidermis should be kept saturated with oil for twenty-four hours before using any other application. The poultices of various kinds that are usually employed to soften and facilitate the removal of the crusts are in various ways unpleasant as well as positively injurious to the patient. Through the elevation of the temperature of the surface which they produce, proliferation of the fungus is rendered more rapid than by its natural increase. Providing sustenance for it, they necessarily hasten its maturity. Poultices likewise furnish the epidermis with moisture, they conduce to its swelling to such an extent that the hairs, entirely filling the follicles, prevent entrance thereto of all antiparasitics. Warm-water dressings and bandages produce the same ill effect, and should for this reason be abandoned. The soap-spirit of the

Germans is a severe remedy, not only soaking into and softening the favus-crusts, but acting destructively on the epidermis, the upper layers of which are often cast off in consequence, thereby furnishing a rich field for the propagation of the fungus. As a detergent lotion which is at the same time antiparasitic and softening to the crusts, without affecting the epidermis, the author knows of nothing better than a twenty-five- to a fifty-per-cent. solution of boro-glyceride. This fluid should be sponged thoroughly over the affected surface after the crusts have been covered with oil of ergot for twenty-four hours. After an hour or two the crusts will readily peel off, and the epidermis will be clear and clean, ready for the application of one of the potent antiparasitics. First among these in order are certainly the mecurials in their many forms. To apply immediately, however, according to the French method, a solution of mercuric bichloride, is worse than useless, for the albuminous surface is sure to be coagulated by it, forming a protective layer of mercuric albuminate over the follicles, beneath which the parasite may live in security. The old salves of white precipitate are no better, for they artificially occlude the follicles, besides congesting the skin in such a manner as to make it grasp the hair tightly and prevent the entrance of the remedy into the follicles. In cases of favus complicated by pustular eczema, due to excessive scratching, the author has found the naphtholized zinc-oleate ointment of great service. It would be useless to employ any remedies in the form of ointments or oils immediately after the crusts have been removed, for the moist condition of the surface prevents their penetrating deeply, especially where the skin is congested, the hairs swollen, and the follicles almost closed. The author therefore directs the hair and skin to be well dried, and after a few hours applies an active antiparasitic remedy freely over the affected surface. The antiparasitic agents *par excellence* are the oleates of mercury and of copper. The author does not wish to be understood to mean by the oleates of mercury the numerous and often worthless solutions of mercuric oxide in oleic acid, pharmaceutically described by the percentage of mercuric oxide that they are supposed to contain. In speaking of the mercuric and the copper oleates the author refers only to the true and definite chemical compounds between oleic acid and mercury or copper. The oleates just referred to can be prescribed as follows:

| | | | |
|---|---|---|---|
| ℞ Ungt. hydrargyri oleatis | ℥ss. | 16. | |
| Adipis | ℥ss. | 16. | M. |

| | | | |
|---|---|---|---|
| ℞ Cupri oleatis | ʒss. | 2. | |
| Adipis | ℥j. | 32. | M. |

A little of the former ointment is first rubbed in well with the finger-tips, and after a few days alternated with the latter, which is astringent, and relieves any irritation that may be set up by the former. The author has not observed any irritating symptoms from the external use of these salts, but, on the contrary, has invariably noticed from their use a speedy disappearance of the fungus. These applications should be made every day or two, and continued for three or four weeks. If, after a cessation of treatment for a week or two, the hair does not assume its natural aspect, and new favus-crusts develop, the treatment should be begun afresh. The author has, however, in but few instances been obliged to resume it. In the manner just described, cures of several severe cases of favus have been effected in about six weeks, and in no instance was epilation used. In all cases, after the crusts have been removed, the use of water is prohibited either as a lotion or as a detergent, for the reason that it acts as an agent in the propagation of the fungus. To determine when the treatment has been sufficient, from time to time a single hair should be extracted from each of the diseased spots in order to see if the fungus is still present. Favus of the epidermis or parts not covered with hair can easily be cured by removing the crusts in the manner previously described, and then applying either mercury or the copper-oleate ointments. Resorcin-ointment is also efficient. A ten-per-cent. ointment of boric acid, chrysarobin, thymol iodide, or europhen may also prove efficacious. An epidemic of 139 cases, all occurring on board one United States ship, is reported by Dr. Sheldon G. Evans,[1] of the navy, in "Jour. of Amer. Military Surgeons," 1903. The origin of the infection was traced to a German apprentice boy who was evidently suffering from the disease when sent to the ship. From him it was spread to the others by the utensils of the barbers aboard and through the custom of changing watch caps. The treatment followed by Dr. Evans was as follows:

The hair of every patient was cropped short and kept so during the entire course of treatment. A solution of mercuric chloride in alcohol 1 to 500 was prepared, and two stiff brushes provided. The heads of all the patients were thoroughly scrubbed with the solution every other day for a week or ten days, within which period all the scales were removed, leaving only a yellowish stain on the scalp. Then a solution of the same strength, in water and glycerin, was prepared and the patient's head bathed therewith, twice a week. Under this treatment, all the cases rapidly improved and a complete cure was effected in a very short time and none developed a second attack. If the scalp was much inflamed or tumefied a mild sulphur, mercurial or zinc oxide ointment quickly relieved it. Electrolysis has been successfully employed by Dr. H. J. Reynolds, the sponge attached to the anode pole being saturated with an antiparasitic solution and applied to the seat of disease, the cathode pole being placed some distance to one side. Favus of the nail, when the disease is circumscribed, is best removed by the knife. If the nail be affected in its entirety with perverted nutrition and hypertrophy, the mercury or copper-oleate ointment should be freely applied.

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[1] Gaillard's Medical Journal, Aug., 1903.

**Prognosis.**—Favus can be regarded as curable, only one fatal case having been observed. If treatment be instituted in the early stages, a cure may usually be obtained without any ill effects. If the parasite has been growing for a considerable period, permanent cicatrization and loss of hair result. Favus is seldom accompanied by constitutional symptoms, but the constant irritation may seriously impair the general health. Ordinary cases of favus yield to proper treatment in six or eight weeks; in obstinate or neglected cases the disease may be prolonged for months or years. It will be found more intractable in scrofulous persons, as well as in those of unclean habits, or who are ill nourished, poorly clad, and badly housed. If left to take its course without interference, favus exhausts its soil very slowly. In some cases the disease disappears spontaneously after the destruction of the hair-follicles; in other cases it lasts throughout life. Favus of the general surface of the body is far more amenable than when it involves the scalp. Favus of the nails is usually very obstinate. The disease is subject to relapses in all cases unless the parasite is thoroughly extirpated. It should not be overlooked that the achorion may remain in children's clothing, books and playthings, as well as in the fur of domestic pets. In this way re-infection may take place after a child has been cured of the original infection.

## TINEA TRICHOPHYTINA.

SYNONYM.—Ringworm.

Tinea trichophytina is a contagious parasitic disease affecting the hairs, the hair-follicles, the nails, and the epidermis of various portions of the body. It is produced by a microscopic fungus known as the trichophyton, and is characterized by the formation of circular erythematous, scaly patches, vesicles, and tubercles, and by various morbid changes in the hairs and nails of the affected area. According to the recent investigations of Sabouraud, confirmed later by other observers, there is at least one other form, known as the small-spored fungus, or microsporon Audouini. Several varieties of the trichophyton, or large-celled fungus, have been described. In children the affection is, in the great majority of cases, believed to be generally due to the microsporon Audouini.

For convenience of description the disease is subdivided in accordance with the region affected. When the scalp is attacked, the disease is termed tinea tonsurans or tinea trichophytina capitis; when the beard is affected, it is called tinea sycosis or tinea trichophytina barbæ; and when the nails are involved, it is named onychomycosis or tinea trichophytina unguium; when, finally, the body is invaded, it is denominated tinea circinata or tinea trichophytina corporis.

## TINEA TONSURANS.

**SYNONYMS.—Tinea trichophytina capitis—Herpes tonsurans—Scheerende Flechte—Teigne tondante—Ringworm of the scalp.**

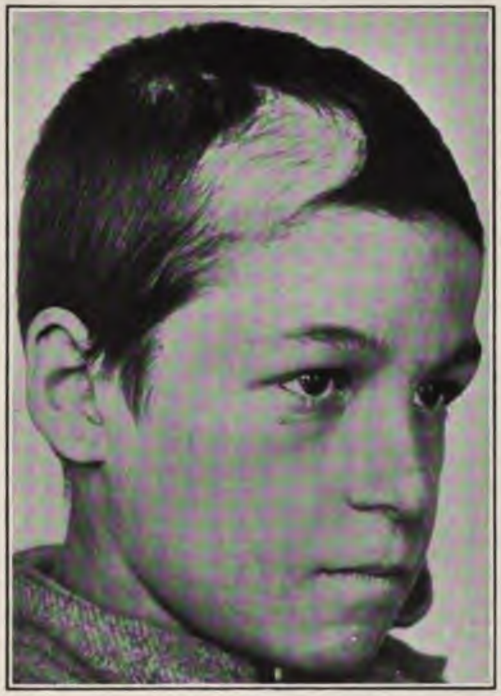
Tinea tonsurans is a contagious vegetable parasitic disease of the scalp, produced by the trichophyton, and characterized by the formation of one or more circular grayish or erythematous scaly patches, upon which the hairs are ragged, broken, or destroyed.

**Symptoms.**—The disease usually manifests itself first as a small, round, pale-red or grayish spot, covered with fine, branny scales, and slightly elevated above the surrounding surface. On close examination one or more similar lesions may be discovered at other points upon the scalp. In some cases a ring of minute papules or papulo-vesicles may be observed upon the periphery of each diseased spot. They are ephemeral in character, however, and speedily terminate in desquamation without becoming transformed into pustules. The hairs may not be perceptibly involved at first, but as soon as the parasite penetrates into the follicles they become dry, lustreless, and brittle, and finally either drop out spontaneously or break off near the surface of the scalp. The disease spreads rapidly by peripheral extension, forming circular patches of varying size that are slightly elevated above the adjacent surface. The lesions are pale-red or bluish-gray in color, and covered by fine white or opaque scales. They are usually situated upon the crown or on the parietal regions of the head, but they may occur upon any portion of the scalp. In some instances the patches are situated partly on the scalp and upon the neck. The follicles of the affected area are prominent, the hairs withered and dull in appearance, and either bent or broken off just above their point of exit. The stumps are thickened and uneven, presenting the nibbled, ragged appearance characteristic of the disease. The hairs are held loosely in the follicles, but owing to their brittleness usually break off at or beneath the surface when an attempt is made to extract them. As the disease progresses they finally become involved throughout their entire length, and then drop out spontaneously, producing more or less baldness. As, however, the hair-papillæ are rarely destroyed, the baldness is only temporary. In mild cases the disease does not penetrate into the follicles, and manifests itself only as a reddened, desquamative condition of the surface. The typical erythematous rings occasionally observed are due to a spontaneous disappearance of the disease from the centre of the affected area while it is advancing at the periphery. In other instances the hairs are involved, but not so extensively as in the typical form of the disease. In severe cases the hair of the greater portion of the surface may fall out. In scrofulous or debilitated children the diseased areas may become the seat of a pustular eruption, terminating in the rupture of the pustules and the formation of thick yellow crusts upon the surface of the scalp. This is a very contagious form of the disease. It is usually accompanied by enlargement of the cervical glands, and other symptoms of constitutional irritation.

Tinea tonsurans is seldom attend by any pain, but more or less itching is present in all cases. The disease may run an acute course, but usually manifests a tendency to become chronic. The patches in chronic cases may be either large and smooth, and almost completely denuded of hairs and scales, or may be covered with a profusion of scales and stumpy hairs, or, as in the disseminated variety, they may consist of a number of minute scurfy spots with apparently healthy hairs, among which, however, a few black hair-stumps may be observed. In the violent form of tinea tonsurans, known as tinea kerion of Celsus, the fungus penetrates into the deepest portion of the follicles and produces a diffused exudative inflammation involving all the layers of the skin as well as the subjacent cellular tissue. Kerion usually begins as one or more grayish or erythematous patches, similar to those which appear in the ordinary form of the disease. The patches, however, soon become yellowish or purplish in color, and boggy, tumid, and painful to the touch. They are considerably elevated above the surrounding surface, and are covered with a yellow, glutinous substance that exudes from the distended follicles. The hairs become brittle and loosened, and finally fall out. When the inflammation is severe, superficial abscesses may be formed and terminate in ulceration of the corium, obliteration of the hair-follicles, and permanent loss of hair. Kerion usually runs an acute course, and terminates in speedy recovery by the destruction of the fungus. In some cases, however, it may assume a chronic character, and remain for a long time.

**Diagnosis.**—The diagnosis of tinea tonsurans is usually easy. Typical cases, presenting erythematous patches covered with fine scales and short, nibbled-looking hairs, can not be mistaken for any other disease. Blackish dots or stumps of hairs situated on disseminated scurfy areas are also significant. The only affections that present any resemblance to tinea tonsurans are squamous eczema, seborrhea, psoriasis capitis, alopecia areata, and impetigo contagiosum. In *squamous eczema* the surface of the scalp is reddened and scaly, but the hairs are normal in character, and are firmly seated in the follicles. There is no history of contagion; the disease is chronic in character, and the diseased area does not continually increase by peripheral extension. In squamous eczema, moreover, the itching is usually intense. In *seborrhea* the surface is scaly, but it is normal in color, and the hairs are not involved. The lesions of *psoriasis capitis* may present a superficial resemblance to those of tinea tonsurans, but the history and course of the two affections are so widely different that they ought not to be confounded with each other. *Alopecia circumscripta* has been mistaken for tinea tonsurans. In typical cases of the former affection, however, the smooth, white, polished surface of the scalp, and

PLATE XXVIII



Tenia Tonsurans.

(See page 860)

the complete absence of hairs and scales from the affected area, point unerringly to the true nature of the disease. In doubtful cases a microscopical examination would be necessary to determine the presence or absence of the trichophyton. This parasite can be easily discovered. One or two of the affected hairs, or a portion of the epidermis, should be covered with a drop of liquor potassæ and placed under a microscopic power of two hundred and fifty diameters, when the fungus and its lesions will be plainly visible. According to Duckworth and Behrend, the chloroform test will also establish the diagnosis. If a hair affected by the trichophyton fungus be placed in chloroform it will imediately turn white, while normal hair will remain unchanged.

*Tinea favus* in its first stage may simulate the erythematous lesions of tinea tonsurans, but the characteristic yellow, cup-shaped crusts of the former should forbid continuous error. The chloroform test may also be employed if necessary to make the diagnosis, as hairs affected by favus do not change in color when they are dipped in chloroform. In favus, moreover, the hairs can usually be pulled out by the roots, while in tinea tonsurans they are brittle, and break off near the surface if an attempt be made to extract them. *Tinea kerion* can readily be recognized by the boggy and inflammatory character of the lesions, and the semi-purulent, glutinous exudation by which they are covered. The lesions of *impetigo contagiosum* are disseminated, and may resemble the pustular complications of tinea tonsurans. Impetigo is an acute affection, however, which does not involve the hairs, and which usually terminates spontaneously in ten or twelve days.

**Pathology.**—The lesions of tinea tonsurans are due to the growth of a vegetable parasite, discovered by Gruby in 1844, and termed by Malmsten the trichophyton tonsurans. It affects the hairs, the hair-follicles, and the superficial layers of the epidermis. It is composed of mycelium and spores. The latter are present in great abundance in all the affected structures, are round, colorless, highly refractive, and are stained with difficulty. The parasite is easily cultivated in non-acid media. The presence of the fungus between the corneous layers of the epidermis produces more or less irritation, resulting in the formation of vesicles, papules or pustules upon a reddened, congested base. The growth then invades the follicles, penetrates into the follicular walls and into the substance of the hair, producing occlusion of the follicles and distortion and disintegration of the hair. In severe cases the inflammation of the perifollicular tissue may be so intense as to result in destruction of the follicles and in permanent loss of hair. In tinea kerion the deepest recesses of the follicles are reached by the parasite, and the resulting irritation is so severe as to produce extensive inflammatory exudation and marked augmentation of the secretions of all the cutaneous glands. The mycelium is scantily developed, and consists of long, slender, forked threads, which are frequently jointed, and ramify in all directions. The spores are small, rounded, refractive bodies that manifest a marked tendency to arrange themselves in rows or groups. They are found in great numbers around the hair-bulbs and papillæ, as well as in the hair-shaft, which is irregularly disintegrated or else cleft longitudinally.

Dr. George Thin has published the result of a series of interesting experiments made with a view of determining the vitality of the trichophyton fungus, and the effect upon it of various agents. From these it appears that the spores retain their power of growth and reproduction for at least eleven months at the ordinary temperature of a London house. They are capable of multiplication after having been soaked in water for two days. Immersion in olive oil for twenty-seven days had no influence upon their vitality. The same negative result attended the action of lard continued for four days, and of vaseline maintained for eight days. The spores were almost completely sterilized by contact with soap-suds for thirty minutes. Exposure for the same length of time to soft soap completely sterilized the spores, but growth took place after a contact of thirteen minutes. One per cent. acetic acid sterilized them in three days, while immersion for the same period in a one-per-cent. carbonate-of-soda solution failed to produce any effect. Sulphur ointment in one-fourth pharmacopeial strength inhibited the growth of the fungus in two hours, while in an hour and a half it sterilized it to a large extent. Six hours' contact with white precipitate ointment of half strength prevented germination, but they survived the contact with the same preparation for two hours. Sterilization was affected in one hour by quarter-strength citrine ointment. In all these cases control experiments were made, and hairs which had not been submitted to the action of the ointments mentioned developed the fungus abundantly. Immersion in croton oil for seven days had no effect upon the vitality of the trichophyton.[1]

Certain practical conclusions may be deduced from these experiments. Washing the scalp with soap and water, unless for a far longer time than can or will be given to the procedure, is incapable of destroying the power of the spores present among the scales on the surface. A weak sulphur ointment is able to destroy all the spores except those which have penetrated deeply into the follicles. The destructive power of weak ointments of white precipitate and nitrate of mercury, especially the latter, is experimentally demonstrated. The action of croton oil is proved to depend upon the inflammation which it produces.[2]

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[1] A similar course of experiments reported by Schweninger are not in complete accordance with those of Thin. According to the former writer, benzoinated lard, yellow and white petrolatum, have a slight inhibitory action, while sulphur (0.2 to 1 per cent.) is totally without effect. Substances which Schweninger found to prevent development were pyrogallic acid, ichthyol, resorcin, corrosive sublimate, and iodoform. Monatschrift für praktische Dermatologie, August, 1890.

[2] British Medical Journal, February 23, 1889, p. 397.

**Etiology.**—Tinea tonsurans is produced by the trichophyton fungus, and is propagated by atmospheric diffusion as well as by contagion. Vidal and Marfan have demonstrated that it is essentially an aërobic parasite. Quinquaud has ascertained that the spores and mycelium of the trichophyton are destroyed by a temperature of 50° to 55° C. (122° to 131° F.). According to the elaborate investigations of Sabouraud there are two varieties of trichophyton, distinguished respectively by large and small spores. This author ascribes most cases, however, to the presence of the microsporon Audouinii. The disease may effect the rich as well as the poor, and the robust as well as the weak and debilitated. Some persons, however, are more susceptible than others to its attacks, owing to a peculiar condition of their epidermis, the character of which has not yet been conclusively determined. Tinea tonsurans is essentially a disease of childhood. It occurs in the lower animals, and is frequently communicated by domestic pets to children.

**Treatment.**—The treatment should be prophylactic as well as curative. The patient should, as far as possible, be isolated. He should be compelled to sleep in a separate bed or room, and be cautioned against handling the wearing-apparel, brushes, or combs of other persons. All woolen clothes must be discarded and removed from the room, in order that the spores may not become entangled in their fibres and aid in spreading the disease. As a further precaution, the heads of all other children in the house should be washed daily with a weak alcoholic solution of borax, and then thoroughly oiled with a solution composed of ten grains (0.60 gm.) of thymol and one ounce (32 gm.) of olive oil, or with the fluid oleate of mercury. If this plan be perseveringly carried out, danger of the spread of the contagion will be reduced to a minimum. Constitutional treatment is not generally necessary, but if the patient is debilitated, anemic, or manifests evidences of scrofulous diathesis, I usually direct a mild aperient, followed by a course of chlorate of potassium or one of the chalybeates. The chloride and iodide of iron are particularly valuable. Codliver oil, malt, and the mineral acids, especially phosphoric acid and its compounds, are of service in improving the nutrition and elevating the general tone of the system. The diet should be nourishing and easily assimilated, and consist chiefly of meat, milk, eggs, and fruit. Fresh air and outdoor exercise are also of prime importance. The rooms in which the patient lives should be cool and well ventilated. Care should be taken not to allow water to stand and evaporate in the room, or to be used on the scalp, as moisture and warmth contribute to the propagation of the fungus. The author usually orders the diseased area and the adjacent surface to be cleansed every day or two with the borax solution which has been previously mentioned. Little or no benefit can be obtained from cutting or shaving the hairs over the affected region, or from extracting the diseased hairs. It is true that by cutting or shaving the hairs the diseased surface can be fully exposed to view, but the irritation resulting from the use of scissors or razor intensifies the itching and general discomfort, and indirectly assists in spreading the disease. Epilation is not only valueless but altogether impracticable, as the affected hairs are usually clasped so tightly by the swollen follicles, and by the ravages of the parasite rendered so brittle, that any attempt at extraction would only result in breaking them off short either within the follicles or just above the surface. Vesication during the early stages of the disease is also a useless, as well as a barbarous procedure. Instead of employing either epilation or vesication, I usually begin the treatment of a case by directing the diseased spots to be sponged every day or two with a weak alcoholic solution of thymol, borax, betanaphthol, or mercuric bichloride, and to be then thoroughly saturated with a fifty-per-cent. solution of boroglycerin (Glyceritum boroglycerini, U. S. P.).

The latter solution can not be commended too highly. In the early stages of ringworm of the scalp I have obtained many rapid cures from its use alone. Borax is one of the most efficient antiseptic and antiparasitic agents. It also possesses mild astringent powers, and tends to allay the itching and irritation of the disease. The glycerin has great penetrating properties, and carries the parasiticide deep into the follicles. It also has a great affinity for water, which it withdraws from the tissues, thus depriving the fungus of one of the elements most contributive to its existence. The boroglycerin solution may be applied night and morning with a little sponge or mop, and should be well rubbed into the follicles with the tips of the fingers. It is destitute of any poisonous or irritating qualities, and acts as a preventive of further contagion, as the parasite adheres to the glycerin, and is not cast off to be wafted about by the air. During all this period the author makes no attempt to epilate, as no benefit can be derived from simply breaking off the hairs. If, however, there is no amelioration of the disease within a short time after resorting to this treatment, if the patches extend, and the implicated hairs still break off or continue brittle, the oleate of copper, a stronger and more decided antiparasitic remedy, can be employed. This oleate has been found to be the most valuable of antiparasitics. It does not produce any constitutional symptoms. Its stimulant and astringent virtues act favorably upon the cutaneous tissue, and it possesses the power of penetrating deeply into the follicles. The copper-oleate ointment, prepared with either four or nine parts of a fatty base, has been used by the author in many cases with uniformly good results. Its use has been criticized by some writers because the clothes are liable to become stained with the ointment. This objection does not hold good, however, when the remedy is properly employed. It should not be thickly smeared on the surface, like an ordinary ointment. Only a small quantity should be applied at a time, and thoroughly rubbed into the affected area night and morning until all traces of the disease have disappeared, and until a new and healthy growth of hair is developed. No water should be applied to the affected part throughout the course of the disease. M. Vidal bases his treatment[1] upon two ideas: the destruction of the fungus, and exclusion of oxygen. The first object is secured by the use of spirit of turpentine as a parasiticide, the second by the application of caoutchouc. He avoids epilation. After application of a turpentine lotion to the scalp, part of the affected surface is rubbed at each sitting with tincture of iodine. This procedure is repeated two or three times upon each spot until the entire area has been so treated. At intervals every day the scalp is anointed with petrolatum or iodized petrolatum and finally the head is kept covered with a closely fitting rubber cap. Sulphurous acid is destructive to the fungus of this disease, and is consequently an efficient remedy. An easy method of applying it is that of Dr. Schuster, of Aix-la-Chapelle, who stretches a net of strings across the lower third of a cardboard box which fits to the head and can be closed by a lid of the same material. A saucer containing burning sulphur is laid upon the net of strings and the box covered. The patient must sit still for half an hour. An abundance of sulphurous-acid gas is generated, the sulphur ceasing to burn as soon as all the oxygen is exhausted.

Jonathan Hutchinson relies mainly on chrysarobin. Twice a week the scalp is well washed with a drachm (4 gm.) of Wright's liquor carbonis detergens to a pint (512 gm.) of hot water, and all scales and crusts removed. Creolin, as liquor cresolis comp. could be substituted for the preparation just named. The compound ointment which he directs to be rubbed into the scalp more or less freely, according to the effects which it produces, is composed as follows: Chrysarobin, one drachm (4 gm.); ammoniated mercury, twenty grains (1.30 gm.); purified wool-fat, one drachm (4 gm.); benzoinated lard, six drachms (24 gm.); liquor carbonis detergens (or cresol), ten minims. He finds a persistent use of this treatment to be followed by a cure. Chrysarobin forms the basis of a treatment proposed by Unna.[2] The hair is cut short and a protective line of zinc gelatin applied to the forehead, temples, and nape of the neck just below the hairy scalp. The affected area is covered with an ointment containing five to ten per cent. of chrysarobin with or without two per cent. of salicylic acid and five per cent. of ichthyol. Oiled silk, gutta percha, or some other impermeable substance is then drawn over the head and its borders fastened to the skin by gelatin. Upon this covering is placed a tarletan bandage, and over the whole a flannel cap or wax cloth. Once a day the dressings are removed and a new application made. On the fourth day, a five-per-cent. ointment of ichthyol is substituted for the chrysarobin. The ichthyol is continued till the end of the week, when all the applications are removed and the head thoroughly cleansed with oil and soap. A second week of treatment according to the same method follows, and so on until a cure results. Dr. A. J. Harrison, of Bristol, recommends the use of an unguent composed as follows: Caustic potash, nine grains (0.54 gm.); phenol (carbolic acid), twenty-four grains (1.5 gm.); purified wool-fat and oil of cocoanut, of each half an ounce (16 gm.). The ingredients are to be well rubbed together, and, if desired, a little oil of cloves, lavender, or rosemary may be added, according to circumstances. A small portion of the preparation is directed to be rubbed on the affected parts every night and morning. He usually finds marked improvement at the end of two weeks, and recovery takes place in about a month in slight, and in about three months in very chronic and severe cases. Drs. Charon and Gevaert, of Brussels, report[1] excellent and rapid results from the method proposed by Professor Henry J. Reynolds, of Chicago. This plan consists in the use of the continuous electric current. The sponge attached to the anode pole is impregnated with an antiparasitic solution and placed upon the affected area, the cathode pole being applied at some distance—upon the breast, for instance, or the back. The current thus enables the solution to penetrate much more deeply. A one-per-cent. solution of corrosive sublimate may be used, or any other germicidal fluid preferred. The impregnated electrode is applied for several minutes. The duration of the *séance* need not exceed thirty minutes, and should occur but once a day. Dr. Leviseur, of New York,[2] epilates, and then rubs into the scalp a lotion composed of tincture of benzoin and bichloride of mercury in the strength of one to three hundred. After the irritation from this measure subsides, which is usually within twenty-four hours, he makes use of a ten-per-cent. ointment of salicylic acid prepared with petrolatum. The strength of the aplications may be carefully increased, until that of the lotion reaches two to three hundred, and of the salve twenty per cent. Sulphur has likewise been efficaciously used in the form of an ointment, combined, it may be, with ammoniated mercury, corrosive sublimate, sulphate of copper, oil of cade, tincture of iodine, or phenol. In this disease some foreign authors advise incorporating the antiparasitic remedy in collodion, solution of gutta percha, or in a plaster. Among other substances which have been employed and recommended are beta-naphthol, thymol iodide, europhen, resorcin, camphor, creolin, salicylic acid, anthrarobin, iodoform, iodol, eucalyptol, and losophan. Another mode of obtaining the action of sulphur, which has been recommended, consists in first washing the head with soft soap twice daily, then sponging it with acetic acid, and applying freely while the head is still wet a wash composed as follows:

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[1] Gazette Hebdomadaire de Médecine et de Chirurgie, July 26, 1889.

[2] Monats. f. prakt. Derm., 1889, No. 12.

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[1] Western Medical Reporter, February, 1888.

[2] Epitome, October, 1889.

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|---|---|---|---|
| ℞ | Sodii thiosulphatis | ʒvj. | 24. |
| | Glycerini | fʒjss. | 6. |
| | Aquæ | q. s. ad f℥vj. | 192. M. |

Dr. Tarabrin, of Ekaterinovka, advocates painting the diseased patches once daily with pure tincture of iodine, or twice daily with that preparation mixed equally with the spirit of turpentine. In other cases he adds to this mixture an equal part of camphorated oil made by combining one part of camphor with nine parts of olive oil. This plan, however, is no more than a slight modification of the methods practiced by Vidal and Besnier in the Hôpital Saint-Louis, Paris. Dr. Purdon, of Belfast, recommends an ethereal tincture of croton-seeds containing salicylic acid. A weak solution (one-tenth of one per cent.) of hydroxylamine has been successfully employed by Eichhoff, but is open to the objection that it may occasion systemic intoxication. If seen very early, painting the patches with phenol or acetic acid may prevent extension of the disease. Dr. J. Hutchinson, of Glasgow, Scotland, has praised the action of *Siegesbeckia orientalis*, the tincture, mixed with an equal portion of glycerin, being applied night and morning to the affected spots.

The treatment of chronic ringworm does not differ materially from that of the acute or recent form, but marked advantage may frequently be derived from employing the oleate of mercury alternately with the oleate of copper. That in this disease the parasite penetrates to the very bottom of the follicles and into the bulbs of the hairs is beyond doubt, and the only remedies that can be of service in such a case must be those capable of equal penetration. While the oleate of copper is to be preferred for this purpose, there are cases in which the oleate of mercury proves even more effective. The last-named oleate may rapidly cure extensive and inveterate cases that have existed for years, and obstinately resisted all other remedies. Although the author has often used the remedy continuously, yet he has never seen salivation or any other of the constitutional effects of mercury follow its external employment. It may be applied in the same manner as the oleate of copper, the five-per-cent. ointment being preferable for very young children, and the ten- to thirty-per-cent. for older ones. It should be well rubbed into the diseased area night and morning, until the parasite is completely extirpated. While the above methods will seldom fail, there are cases in which the adopted remedies do not produce the expected effects, on account of the treatment not being properly carried out in detail, thus baffling all efforts. In these cases, and in these alone, the production of artificial kerion may be justified as a last resort—as one, however, that rarely, if ever, fails. As kerion has been described as Nature's effort to effect a cure, and it is associated with a loosening and falling out of the hairs, this condition is artificially produced with the view of accomplishing a similar result.

The best application for the purpose of producing kerion is croton oil. As, however, this remedy must not be used carelessly or upon a very large surface, it should be daintily applied with a camel's-hair pencil to small inveterate patches, and should be immediately followed by a poultice of flax-seed, or a warm-water dressing, well secured to the parts. This treatment should be daily repeated, even if pustulation follow, until distinct infiltration and puffiness of the scalp is observed, and the patches shall have assumed an aspect similar to that of true kerion. The scab is then to be removed, and the ointment of either the oleate of mercury or the oleate of copper applied to the exposed surface. After one spot is thus cured the others may be similarly treated, one at a time, until all traces of the disease shall have disappeared. It may take five or six applications to each spot to produce the desired effect, but it is sure to follow if the treatment be properly pursued. As this process is a severe measure, it should never be lightly attempted, and the parents of a child should be duly informed of its character, as otherwise they might become alarmed at the amount of the inflammation, and withdraw the patient from further treatment. The disseminated variety of the disease which Alder Smith speaks of should be managed in accordance with the preceding methods. The solution of boroglycerin should also be continuously applied, and the hair be closely examined with a lens for stumps and black dots. If either are found, they should be promptly treated by the method recommended by Alder Smith—that is, by the application of drops of croton oil to produce pustulation, or by puncturing the follicles with a gold needle dipped in that oil. Treatment should be kept up in this manner until stumps and black spots are no longer visible, and the entire surface is covered with downy hair.

In the management of epidemics of ringworm occurring in schools and asylums, the most important measures are cleanliness and isolation. The heads of the healthy children should be frequently examined, and washed daily with the solution previously mentioned. When, finally, all those affected have been cured, the sick-rooms should be whitewashed and painted, the floors washed with a solution of betanaphthol or mercuric bichloride, and the clothing, brushes, combs, etc., used by the patients should be burned, so as to destroy all vestiges of the parasite, and to prevent the disease from breaking out anew. When kerion occurs idiopathically, all harsh or irritating measures must be avoided. The surface should be saturated with the official boroglyceride solution, and when the crusts are removed the ointment of the oleate of mercury should be well rubbed into the follicles of the affected area. In France, the treatment of ringworm by the x-rays has given very satisfactory results, in the hands of experienced administrators. After one *séance*, the hair falls out in the course of 18 or 20 days. Repeated applications may be needed to destroy the spores according to the experience of Barjou.[1]

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[1] Lyon Médical, March 31, 1907.

**Prognosis.**—The prognosis of tinea tonsurans, under proper management, is always favorable. The time required to effect a cure varies in accordance with the number and size of the diseased patches, the length of time that has elapsed since their first appearance, and the general condition of the patient. Some cases yield readily to the most simple measures, others persist for a long time notwithstanding all remedies; but even in the most obstinate cases the disease exhausts itself sooner or later, and spontaneously disappears. It rarely continues after puberty. Relapses are not of frequent occurrence, but if the smallest vestige of the parasite has escaped destruction it may, under favorable circumstances, soon redevelop luxuriantly over a large area.

## TINEA SYCOSIS.

**Synonyms.—Tinea trichophytina barbæ—Sycosis parasitica—Parasitäre Bartfinne—Mentagra parasitica—Trichophytie sycosique—Barber's itch.**

Tinea sycosis is a contagious vegetable parasitic affection of the bearded portion of the face and neck, occurring therefore, of course, only in adult males. It is produced by the trichophyton, and is characterized by the formation of papules, tubercles, and pustules, and the occurrence of various morbid changes in the hairs of the affected area.

**Symptoms.**—Tinea sycosis is, as remarked, a disease of the male sex exclusively. It may occur at any time during adult life, but is met with most frequently between the twentieth and the fortieth years of age. It usually begins as one or more small, round, erythematous, scaly patches situated on the cheeks or the chin. The spots vary from one-fourth of an inch to half an inch or more in diameter. They are slightly elevated above the surrounding surface, and are the seat of a more or less itching and burning sensation. The patches are occasionally surrounded by a ring of minute vesicles that rupture spontaneously in a day or two after their appearance. If the nature of the lesions be recognized and appropriate treatment adopted, the disease may be arrested at this stage. If neglected, the spots increase in size and become distinctly swollen, indurated, and more or less painful. The adjacent patches coalesce, forming one or more large, irregular, dark-red or purplish areas. Finally, as the fungus penetrates deeply into the follicles, the hairs become involved, and violent inflammation of the lower portion of the corium and subcutaneous connective tissue occurs as the consequence of the irritation by the parasite. Papules, tubercles, and pustules are developed around the orifices of the follicles. The papules are usually large in size, and frequently coalesce, forming tubercles which are of various shapes and sizes. The tubercles are firm, and slightly painful to the touch. They are deeply situated in the corium and subcutaneous connective tissue, but project more or less above the surface, to which they give a nodular appearance. The pustules are of varying sizes, and tend to rupture spontaneously, forming thick yellow crusts situated upon a reddened, excoriated, discharging surface. The hairs are not noticeably affected at first, but as the disease progresses, they become dry, lustreless, brittle, and either twisted or broken off just above the orifices of the follicles. They are finally diseased throughout their entire length, or loosened by the suppurative process and drop out spontaneously. In severe cases large areas may in this manner be entirely denuded. Cicatricial deformities may be produced. In mild forms the disease may manifest itself only by a reddened, desquamative condition of the epidermis, leaving the hairs unaffected. In still other cases, resembling the disseminated variety of tinea tonsurans, congested spots upon which the hairs are brittle and dull may be observed at several points, but neither tubercles nor pustules are formed. Tinea sycosis may develop first on the neck or on the face. The malady may attack either or both sides of the face, and not infrequently spreads over the entire submaxillary region. Tinea sycosis seldom involves the upper lip or the upper portions of the cheeks. It is rarely accompanied by manifestations on other regions of the body. In rare instances the disease extends to the mucous membrane of the lips, mouth, or nostrils. The disease may exceptionally terminate in spontaneous recovery, but as a general rule it assumes, if left untreated, a chronic character, and remains for years.

**Diagnosis.**—The only affections for which tinea sycosis might be mistaken are non-parasitic sycosis, pustular eczema, acne, favus, and the syphilides. In *non-parasitic sycosis,* however, the inflammation is superficial in character and characterized by the formation of pustules. In tinea sycosis the deeper layers of the skin as well as the follicles are involved, and tubercles and nodules are formed in the affected area. Non-parasitic sycosis is usually accompanied by intense pain, itching and burning, while in tinea sycosis these symptoms are seldom very marked. Non-parasitic sycosis frequently involves the upper lip, while tinea sycosis is rarely or never observed there. Finally, the hairs are not affected in the former disease, while in the latter they are twisted and broken off, or spontaneously expelled from their follicles. In doubtful cases the diagnosis can always be placed beyond question by a microscopic examination. The crusts of tinea sycosis sometimes resemble those of pustular eczema. *Eczema,* however, is accompanied by intense itching and burning. The crusts form rapidly upon an eroded, exudating surface, but there are no tubercles or nodules, the hairs are normal in appearance and texture, and remain firmly fixed in their follicles. When the papules and pustules of *acne* occur upon the hairy region of the face they might be mistaken for tinea sycosis; but the occurrence of similar lesions on other portions of the face, the absence of itching and desquamation, and also of tubercles and nodules, and likewise the normal character of the hairs, make the diagnosis easy. Various *syphilitic,* pustular, papular, and tubercular manifestations may, when they appear upon the face, chin, or neck, simulate tinea sycosis, but in these the hairs are not involved, there is little or no itching, and microscopic examination will fail to reveal the presence of the trichophyton. The crusts that occasionally form in tinea sycosis may resemble those of *favus*, but in the latter disease there is no excoriated, exudating surface, the hairs have not a nibbled appearance, and no tubercles or nodules are deeply situated in the corium and subcutaneous connective tissue.

**Pathology.**—The pathological changes that occur in tinea sycosis are similar to those of tinea tonsurans. The trichophyton fungus produces more or less irritation and hyperemia of the surfaces, and then penetrates into the hair-follicles and between the upper layers of the epidermis. It also invades the follicular walls, producing intense irritation and inflammation, resulting in the formation of deep-seated papules, tubercles, and pustules. The parasite ramifies around and within the hair-shafts, producing more or less disorganization of their structure. It consists of mycelium and spores identical in arrangement and appearance with those which are found in tinea tonsurans.

**Etiology.**—Tinea sycosis is due to the trichophyton, and is propagated by contagion. It may be secondary to the ringworm peculiar to other portions of the body, or be contracted from children suffering from ringworm of the scalp. Tinea sycosis is, however, usually acquired by using the shaving-brush or razor of an infected person. It would be a proper precaution for the barber to immerse his brush, after being used, in boiling water containing some simple antiseptic. The disease may also be communicated by the barber's hands, which are never surgically clean. The disease may appear in the robust as well as in the weak, but it seems to require certain peculiar soil for its full development.

**Treatment.**—The treatment usually recommended in this affection consists in cutting or shaving the beard and epilating the diseased surface, and then applying sodium thiosulphate, mercuric bichloride, sulphurous acid, boric acid, and other antiparasitic remedies to the surface. I fail to see any advantage in either cutting the beard close or shaving, owing to the irritation produced by both these measures. The remedies specified often act rapidly and effectively without this procedure. One of the most efficient applications for this variety of the disease is a fifty-per-cent. solution of boroglycerin, employed in the same manner as in tinea tonsurans. A ten-per-cent. ointment either of the oleate of mercury, or of the oleate of copper, will frequently be found serviceable, in lessening infiltration and induration as well as in destroying the parasite. It should be applied night and morning until all traces of the disease shall have disappeared. To prevent the communication of the affection, a ten-per-cent. solution of thymol in olive oil, or oil of sweet almonds, should be rubbed in over the entire bearded surface. If follicular suppuration or fungous granulations occur, a weak ointment of the oleate of nickel will be found invaluable in restoring healthy action. In obstinate cases, characterized by exuberant granulations and continual destruction of the hairs, the surface should be brushed over with an infusion of jequirity. This will induce violent inflammation and profuse suppuration, but will finally result in a cure. Dr. Cavafy's boric-acid lotion is also an effective application in both recent and chronic cases. Its formula is:

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| ℞ | Acidi borici .......................... | ʒiv. | 16. |
| | Etheris sulph. .......................... | f℥v. | 160. |
| | Spiritus vini rect. ...............q. s. ad | f℥xx. | 640. |

M. Ft. lot. Sig.: Apply to the diseased surface three or four times daily.

Hydroxylamine has been recommended; thymol iodide and europhen (diïsobutyl orthocresoliodide) are likewise efficient.

**Prognosis.**—The prognosis is always favorable, but the time requisite to effect a cure varies considerably. In some cases the most simple measures speedily suffice, while, in others, months may elapse before the disease is eradicated. Relapses will occur unless the parasite is thoroughly destroyed.

## TINEA CIRCINATA.

**Synonyms.**—Herpes circinatus—Trichophytie circinée—Ringworm of the body.

Tinea circinata is a contagious, vegetable parasitic cutaneous disease, produced by the trichophyton, and characterized by the formation of one or more, round or oval, erythematous, scaly patches upon the general surface of the body.

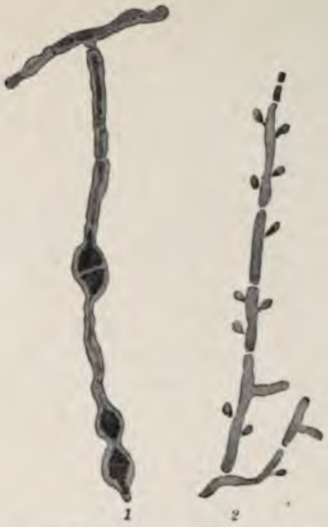
**Symptoms.**—This form of ringworm differs from the preceding varieties only by its location, being situated chiefly in the superficial layers of the epidermis, and upon portions of the body that are either destitute of hair or scantily provided with lanugo. If ringworm of the body spreads to the scalp, or other hairy regions of the body, it assumes the form of tinea tonsurans. It usually begins as a small, round, reddish spot, slightly elevated above the surrounding surface, presenting a branny or scurfy appearance. Tinea circinata may or may not be acompanied by itching. The spots rapidly increase in size by peripheral growth, attaining a diameter of half an inch or more in a few days. The margins of the patches are distinctly elevated, and in some cases surrounded by a ring of minute papules, or papulo-vesicles, which terminate in desquamation. Owing to the tendency manifested by the disease to disappear at the centre while it extends at the periphery, the lesions soon assume the characteristic annular form. When a large ring is formed in this manner the affection may reappear again in the centre, and by pursuing the same course terminate by the formation of a series of concentric rings. When two or more patches are present upon the same region of the surface, they frequently coalesce so as to form large, irregular, reddish, desquamative areas. When the peripheries of two or more rings meet, a variety of semicircular, serpentine, erythematous, scaly lesions are formed. The lesions are accompanied by slight itching and tingling sensations. In some rare cases, the itching is so excessive and productive of so much scratching, that a mild or severe eczema may be superadded to the original disease. Tinea circinata varies in intensity and duration in accordance with the amount and activity of the fungus, and the condition of the epidermis of the patient. It may pursue a mild course and disappear spontaneously in a few weeks, or may, if left untreated, become chronic and remain for an indefinite period. When the disease is contracted from the lower animals it is especially obstinate. In chronic ringworm of the body, the lesions consist of one or more isolated patches, which are reddish or brownish and covered with small scales. They are irregular in shape and variable in size, and as a rule are not accompanied by subjective symptoms. Their color disappears upon pressure, but returns as soon as the pressure is removed. The spots remain either stationary or increase in size very slowly. Occasionally they become markedly diminished in size, or apparently disappear during the summer, appearing again in the winter. Tinea circinata may develop upon any portion of the body, but is observed most frequently upon the face, neck, and the dorsal surfaces of the hands and arms. It may be occasionally seen beneath the mammæ or in the axillæ, between the nates, around the genitalia, and upon the inner surfaces of the thighs. When it appears upon the last-named region it is known as tinea circinata cruris. This is the affection which was formerly described by Hebra as "eczema marginatum." It is characterized by the development of a number of small, reddish, elevated spots situated in the upper, inner portions of one or both thighs or on the scrotum. Owing to the heat and friction to which these patches are subjected, their surfaces become eroded and covered with crusts. They rapidly increase in size, and coalesce so as to form large, irregular, semicircular or serpentine lesions, that involve the entire genito-crural region, and even extend over the lower portion of the abdomen. Their margins are sharply defined and distinctly elevated above the adjacent normal skin. The lesions are accompanied by intense itching, which induces excessive scratching, resulting in the development of a more or less acute eczematous inflammation. Vesicles and pustules are not infrequently developed around the margins of the patches. Tinea circinata sometimes occurs upon the sole or dorsum of the foot.

In tinea trichophytina unguium, or onychomycosis, the parasite penetrates the nail-substance, producing various hypertrophic and degenerative changes. The nails become dry, opaque, and brittle, more or less distorted and thickened, and manifest a tendency to fissure or to peel off in layers. This variety of the disease is usually secondary to ringworm of other parts of the body. It may, however, occur primarily in adults as a result of attending to or caring for children suffering with tinea tonsurans. It is a rare form of the disease, however, and is peculiarly resistant to treatment.

Tinea imbricata, Chinese ringworm, India ringworm, Burmese ringworm, D'hobie itch, and other similar terms, designate certain forms of tinea circinata that occur in various parts of the East. They are characterized by profuse desquamation and by inflammation of the surface, are frequently obstinately resistant to treatment, and usually tend to pursue a chronic course.

**Diagnosis.**—The diagnosis of tinea circinata is not, as a rule, difficult. Typical annular, scaly, erythematous lesions can not be mistaken for any other disease. Isolated patches of the affection might, it is true, be confounded with eczema, seborrhea, syphilis, or psoriasis. In *eczema*, however, the eruption is not sharply defined, but gradually fades into the surrounding skin. The surface in eczema is hot, painful, and besides being, as in tinea circinata, the seat of intense itching, with more or less exudation, has vesicles, papules, or pustules at all points, and not upon the periphery only, as in ringworm. Finally, the patches of eczema are not circular but are irregular in form, and never manifest any tendency to heal in the centre. In *seborrhea* of the body the spots often assume an annular form, and are more or less elevated above the surface and covered with fine scales. They are normal in color, however, the scales greasy, the follicles perceptibly dilated, and no vesicles or papules are developed at the periphery. The disseminated form of *psoriasis* may present some resemblance to tinea circinata, but the history and course of the diseases are so widely different that no error should be made in their respective diagnosis. *Favus* of the body can readily be distinguished from tinea circinata by the presence of its characteristic cup-shaped yellow crusts with their peculiar mousey odor. The erythematous and papular cutaneous manifestations of *syphilis* might be confounded with tinea circinata, but the number and wide diffusion of the lesions, their slow peripheral growth, and the absence of itching, should exclude ringworm as a factor in their development, while the history of infection and the presence of other symptoms of syphilis should make the diagnosis certain. A microscopic examination of a portion of the epidermis ought to be made in all doubtful cases, in order to determine the presence or absence of the parasite. A case of tinea trichophytina cruris might tend to be mistaken for intertrigo or ordinary eczema. One has only to recollect that the elevated margins and the annular or serpentine form of the lesions of the former, and the intense itching by which they are characterized, are peculiarities of the parasitic disease. The presence of the trichophyton, if ascertained by microscopical examination, will place the diagnosis beyond doubt.

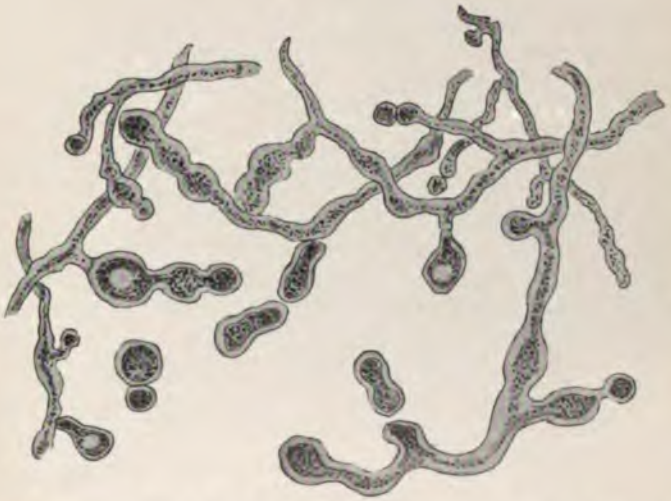
# PLATE XXIX



Fructification of Ringworm.

(See page 875)

1. From an impression preparation of a culture of trichophyton ectothrix on maltose-agar 16 days old. Shows aerial hyphæ with terminal and lateral buds.
2. From a scraping of a culture of trichophyton ectothrix.



Budding Yeast from Lesion of Skin (Carcinoma with Necrosis). Similar Findings Characterize Blastomycetic Dermatitis.

(See page 880)

**Pathology.**—The lesions of tinea circinata are due to the presence of the trichophyton fungus. The fungus consists of spores and mycelium that ramify over the surface and insinuate themselves between the superficial layers of the epidermis, producing more or less irritation, resulting finally in desquamation and the formation of erythematous or hyperemic areas of various shapes and sizes. When the irritation becomes excessive, the stage of congestion passes into that of inflammation, vesicles and papules are formed, and there is more or less exudation. In severe cases, or in those occurring in portions of the body subjected to friction or pressure, the irritation and itching may be so severe as to induce violent scratching, which intensifies the suffering, and frequently develops a severe eczema as a complication.

**Etiology.**—Tinea circinata is derived, as already noted, from the trichophyton, and is propagated by contagion. It occurs in both sexes and at all ages, but is more frequently observed in children than in adults. The disease is of frequent occurrence in the lower animals, and may be contracted from them by man. Tinea circinata may attack the robust as well as the debilitated, but as a rule a peculiar or weak condition of the epidermis is necessary to its development.

**Treatment.**—Constitutional remedies are unnecessary in tinea circinata, except in anemic, debilitated, or scrofulous persons, to whom either chlorate of potassium, the tincture of the chloride of iron, iodide of iron, or codliver oil, may be given with decided benefit. The indications for local treatment are to use agents that will destroy the parasite or indirectly eliminate it from the surface by producing desquamation of the superficial layers of the epidermis in which it is situated. One of the very best applications is a lotion of two or three grains (0.12 or 0.18 gm.) of mercuric bichloride in equal parts of alcohol and cologne-water, painted over the diseased area every night and morning. The boric-acid lotion is effective and elegant. Alcoholic solutions of phenol, or carbolic acid, a drachm (4 gm.) to the fluid ounce (32 gm.) of alcohol, or of salicylic acid a drachm (4 gm.) to the ounce (32 gm.), or of thymol thirty grains (2 gm.) to the ounce (32 gm.), may be used with benefit. Strong acetic acid, or pure tincture of iodine, will frequently prove curative. Chromic acid has been successfully used in an aqueous solution of one hundred grains (6 gm.) to the ounce (32 gm.). To avoid a corrosive action upon the neighboring integument, the latter should be protected by some ointment, and the excess of acid immediately neutralized by means of an alkaline wash. Among other effective lotions may be mentioned sulphurous acid, one drachm (4 gm.) to the fluid ounce (32 gm.) of alcohol; thiosulphate of sodium, eighty grains (5.20 gm.) to the ounce (32 gm.); betanaphthol, forty grains (2.60 gm.) to the ounce (32 gm.); and creosote, one drachm (4 gm.) to the ounce (32 gm.). Of chrysarobin, seven grains (0.50 gm.), dissolved in an ounce (32 gm.) of chloroform, will be found effective.

Anthrarobin has been brought forward as a substitute for chrysarobin. It may be used in alcoholic solution. Nitrate of silver dissolved in spirit of nitrous ether, forty grains (2.60 gm.) to the ounce (32 gm.), has been used with good effect. Ointments are sometimes of more service than lotions. The ointment of the acid nitrate of mercury, with an equal quantity of lard, will be found especially valuable. Among other useful ointments are those composed of pyrogallic acid, fifteen grains (1 gm.) to the ounce (32 gm.) of a fatty base; phenol (carbolic acid), twenty to thirty grains (1.30 to 2 gm.) to the ounce (32 gm.); bichloride of mercury, three grains (0.18 gm.) to the ounce (32 gm.); oil of cade, one drachm (4 gm.) to the ounce (32 gm.); salicylic acid, forty grains (2.60 gm.) to the ounce (32 gm.); thymol, twenty grains (1.30 gm.) to the ounce (32 gm.); and resorcin, twenty grains (1.30 gm.) to the ounce (32 gm.). An ointment of oxide of manganese has been reported to yield success. The iodide of lead ointment is commended by Dr. Whitla, and the compound tar ointment of the National Formulary may be employed with advantage, which is composed as follows:

| | | |
|---|---|---|
| Oil of tar ........ | 4 Gm. | gr. 62 |
| Tinct. of benzoin (U. S. P.) | 2 c.c. | ♏ 32 |
| Oxide of zinc ...... | 3 Gm. | gr. 46 |
| Yellow wax ....... | 26 Gm. | gr. 401 |
| Lard ............. | 32 Gm. | ℥j. (av.) and gr. 56 |
| Cotton-seed oil ... | 35 Gm. | ℥j. (av.) and gr. 103 |

The various sulphur preparations may also be used with benefit. Chrysarobin, in the form of an ointment or a lotion, twenty grains (1.30 gm.) to the ounce (32 gm.), is effective, but it stains the surface and the clothing, and if accidentally brought into contact with the eye will produce violent conjunctivitis. Some have made use of the oil of cajuput as a parasiticide in this affection. Wilkinson's ointment, Coster's paste, and alcoholic solutions of sapo mollis (viridis) have long been recognized as potent applications. In the experience of the author, however, no other remedy is so effective as the ointment of the oleate of copper, either alone or in alternation with the ointment of the oleate of mercury. In mild cases any of the ointments or lotions previously mentioned will be sufficient to effect a cure in a short time. Nothing can be gained, in obstinate cases, by employing in quick succession a number of different remedies. If the disease manifests any tendency to linger, the ointment of the oleate of copper should be applied at once. It may be well in some patients to commence with the five-per-cent. ointment, and then increase its strength as necessary. In chronic cases, the ointment of the oleate of mercury should be used in alternation with the oleate of copper mixed with a fatty base. If eczematous complications manifest themselves, the ointment of the oleate of zinc, or of the oleate of bismuth combined with oil of cade, may be employed with advantage.

The treatment of *tinea trichophytina cruris* is essentially the same as that of the other varieties of ringworm. It must not be forgotten, however, that in this form of the disease there is, in addition to parasitic irritation, an aggravated hyperemic condition of the surface produced by moisture and friction, and that soothing and astringent remedies are as indispensable as antiparasitics. In several cases which came under my observation, immediate relief and rapid cure were obtained through the application night and morning of the following ointment:

| | | |
|---|---|---|
| ℞ Phenolis | gr. v. | 0.30 |
| Cupri oleatis | gr. x. | 0.60 |
| Ungt. zinci oxidi | ℥j. | 32. |

M. Ft. ungt.

Dr. Gottheil, of New York, highly extols sublamine (ethylene-diamine mercury sulphate), 1-1000 solution.

The affected surfaces were also dusted over with a powder composed of equal parts of pulverized starch and the oleate of zinc, in order to prevent chafing and to produce a slight astringent action on the cutaneous glands and vessels. The severe tropical forms of the affection can be most effectually treated by the application of a strong ointment of oleate of copper, of oleate of mercury, or of an ointment of chrysarobin, of thirty grains (2 gm.) to the ounce (32 gm.). The best treatment for ringworm of the nails consists in removing as much as possible of the diseased portion with the knife, and keeping the remainder covered with a ten- or twenty-per-cent. ointment of the oleate of mercury until the entire diseased area shall have exfoliated and been succeeded by a new and healthy growth. The ointment of the oleate of copper or of the oleate of tin may be used alternately with the oleate of mercury. Before paring the nail it may be softened by means of potash solution. Instead of the oleates mentioned some authorities recommend solutions of corrosive sublimate and creosote.

**Prognosis.**—The prognosis of tinea circinata is always favorable. Many cases terminate spontaneously, others prove more or less unyielding to treatment, but a cure is certain even in those most obstinate, if the treatment be judiciously directed and persistently followed. Tinea trichophytina cruris and tinea trichophytina unguium are the most difficult varieties of the disease to overcome, but they are less intractable than was formerly supposed. Relapses may occur if the patient be again exposed to contagion.

DERMATITIS TROPICA OR D'HOBIE ITCH. D'hobie itch (d'hobie, a washerwoman) includes a group of inflammatory, contagious affections of the skin, mainly of the axilla and of the perineum and adjacent parts, usually confined to the tropics, but also seen occasionally among returned soldiers or tourists from the Philippines. It is not properly entitled to be considered as an independent disease, but represents a group of diseases of a vegetable parasitic nature, as the rule, which cause especial annoyance in hot countries.

**Etiology.**—At least three varieties of d'hobie itch have been recognized. One is identical with pemphigus contagiosus. A large proportion are cases of ringworm of the body, and are produced by the tinea trichophytina. Manson has found that another large group corresponds with tinea versicolor. Others have been identified as erythrasma, while some, according to Hyde, are non-parasitic.

**Treatment.**—The most effective remedies are those which have just been recommended under "Tinea Circinata."

## TRICHOMYCOSIS NODOSA.

Under the above title a peculiar affection of the hairs of the axilla and scrotum has been studied by Dr. R. G. Patteson,[1] of Dublin. This disease had not been entirely unnoticed before, but had never been so closely investigated and traced to its origin. Cases have hitherto been in all probability confounded with atrophy of the hair, or trichorrhexis nodosa. The affection was described nearly twenty years ago by Paxton in an article "On a Diseased Condition of the Hairs of the Axilla, probably of Parasitic Origin." Sir Erasmus Wilson subsequently wrote of the disease under the name of leptothrix. Descriptions have also been given of the same malady by Michelson, Radcliffe Crocker, J. F. Payne, and Walter G. Smith.

The affected hairs are dull and dry in appearance, and to the touch are rough and knotty. Examined against the light or by a simple lens it is perceived that the roughness is due to minute concretions which project from the side of the shaft. These concretions may assume two forms, the nodular or the diffuse. The nodules are generally seated upon the outer, or terminal, third of the shaft, and are separated from each other by intervals of healthy hair. The diffuse form, with only narrow intervals of healthy structure, may spread along nearly the entire length of the shaft. The two forms represent different stages of the same process, and both are not uncommonly present upon a single hair. The masses adhere very closely to the hair, and can not be forcibly removed without injury. The shaft, nevertheless, is not abnormally brittle, and has little tendency to break in the situation of these nodes. Only the diffuse form occurs toward the bulb. The disease never penetrates into the hair-follicle.

**Etiology.**—The origin of the affection Dr. Patteson believes to be a bacillus which he has isolated and described. These organisms appear in the form of short, fine rods with slightly rounded ends, about two to three times as long as broad, and about one-fourth the diameter of a red blood-corpuscle. They stain readily with any of the aniline dyes. Dr. Patteson did not succeed in cultivating these bacilli upon sterilized potatoes or peptone-gelatin.

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[1] "Trichomycosis Nodosa: A Bacillary Disease of the Hair." By Dr. R. Glasgow Patteson, B.A., M.B. British Medical Journal, May 25, 1889.

The heat and moisture of the parts in which the affected hairs grow loosen the epidermic scales of the shaft and allow the bacilli to gain an entrance into the cortex, though they never penetrate deeply into the hair. At first they lie in small pits or depressions on its surface. As they develop the cortical fibres split longitudinally. At the same time a hard, homogeneous and slightly granular substance is generated between and around the microbes. The bacteria are encapsulated by this substance which forms the nodular or diffused projections, and which resembles that by which pediculi fasten their ova to the hairs. The material is extremely hard, insoluble in alcohol, ether, chloroform, and other solvent fluids, and resists the action of strong acid and alkaline solutions.

**Treatment.**—This affection, like *trichorrhexis nodosa,* may be treated successfully with hydrogen dioxide applied with a wet brush or cloth to the beard. L. Deheyser,[1] as the result of his researches into the pathology of trichorrhexis claims that it likewise is due to certain micro-organisms. In 15 cases he found a small, round micrococcus, grouped in twos and fours, staining with Gram, growing on agar-agar in pure culture, not liquefying gelatin. The author reports several cases as occurring in the same family; and he found the micro-organism on the hair brush. He announces his conclusion that a certain amount of mechanical irritation, associated with chemical irritation may produce trichorrhexis, so that exceptionally a trophic cause may exist; but in the great majority of cases the disease is due to the micrococcus isolated by him.

## ACTINOMYCOSIS.

SYNONYMS.—Ray-fungus disease—Lumpy jaw.

Actinomycosis is an infectious disease in which globular tumors form beneath the skin. The overlying integument is of a livid color. The tumors may be either hard or soft to the touch, but eventually disintegrate and discharge through fistulous tracts. The matter which escapes is at first purulent, but subsequently becomes sanious. It contains numerous yellow granules which vary in size from a pin's-head to a hemp-seed. The involvement of the surface is usually secondary to an affection of the deeper tissues, as the lungs or vertebræ. Actinomycosis is principally a disease of cattle, in which it affects the inferior maxilla, and is therefore popularly known as "lumpy jaw."

**Etiology.**—The yellow granules are due to an aggregation of a radiate fungus known as *actinomyces bovis,* which may enter the system through

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[1] La Clinique, No. 37, 1907.

a lesion connected with a decaying tooth, but may als
digestive canal, lungs, or an abrasion of the skin. 
the substance of the tumor.

**Symptoms.**—Before the establishment of fistu
sarcoma. The yellowish bodies discharged are, ho
actinomycosis, and the microscope shows the pecu
fungus. Nodules of the same character have bee
intestine, liver, kidneys, and, in rare instances, in n
lymphatic glands are not affected, and this fact, i
presence of the yellowish granules of the ray f
actinomycosis. In the pulmonary form of the d
found in the sputum. The clinical features pa
inflammatory and neoplastic manifestations. T
chronic and variable course.

**Treatment.**—If the tumors are superficially
removed by surgical procedures. The prognosis is
is the most effective internal remedy at our com
disease is recognized and the administration of th
favorable are the prospects for the arrest of the di
be progressively increased to the limit of toleratio
combination of corrosive chloride and potassiu
employed arsenic, either alone or associated with
Schamberg suggests that opsonotherapy may be fou
ment of skin diseases of a parasitic character, suc
actinomycosis.[1]

## BLASTOMYCETIC DERMATIT

SYNONYM.—Blastomycosis.

This title has been given to a parasitic dis
dependent upon the growth of the yeast-fungus, or
consists principally of round or oval forms and gro
It readily stains in aniline solutions, and in so
mycelium is seen. The diagnosis between this d
syphilis must be made by the microscope. The ap
is characteristic; it resembles a budding yeast-
parasite enters the body through the hair-follicle
or other appendages of the skin. In fatal cases i
Dr. Alembert W. Brayton, of Indianapolis, gives t
making an immediate diagnosis of blastomycetic
detailed by Dr. W. T. S. Dodds: "A small bit of ti
margin is placed upon a glass slide, washed with e
remove fats; it is then macerated in a twenty-per-

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[1] Journal of Cutaneous Diseases, Dec., 1907.

solution for five minutes, and then examined with a one-sixth to a one-twelfth objective for yeast-cells."

**Symptoms.**—The disease begins clinically in the form of papules or pustules, resembling those of acne. These soon undergo ulceration, enlarge, and form abscesses; neighboring lesions may coalesce to form a fungus ulcer. There may be a number of foci upon the surface. After the disease has existed some time, the cases usually present a clinical appearance resembling lupus verrucosus. The large lesions are usually provided with crusts, covering a papillomatous surface; hence they are sometimes described as soft, warty growths.

There may be attempts at healing, but there is no tendency to permanent cicatrization. The border of an ulcer is slightly raised above the general surface, and between the papillary excrescences of the lesion are small points from which pus can be expressed. External to the margin the skin is of a bluish-red color. The lesions are moderately painful. Glandular involvement is usually absent, but metastases to internal organs may occur, leading to a fatal termination. In the absence of the latter complication, excision and plastic procedures accomplish a good result. Dr. A. W. Brayton[1] has recorded a very interesting case of blastomycosis. He likewise has reported eight other cases in Indiana. Hyde and Montgomery,[2] of Chicago, have had over fifty cases of this disease.

In a case of systemic blastomycosis reported recently by Krost, Moes and Stober,[3] there were numerous skin lesions of papillomatous appearance covered with a thin, yellow crust. On removal of the crust, a small quantity of pus was discovered. Some of the lesions had some resemblance to epithelioma. In addition, there were a number of painful swellings, the size of a walnut or larger. Around some of the joints there were also localized swellings, with pain, fluctuation, tenderness and slight redness of the overlying skin. The patient died with general infection of the lymph glands, viscera and some of the bones (sternum and ribs). Examination of the urine during life revealed the presence of the yeast fungus, which was found at the postmortem to be accompanied by ulceration of the prostate, which possibly explains their presence in the urine. Cultures of the blood showed colonies of blastomycetes, and this organism was also demonstrated in the pus of the lesions in the brain, ribs and skin.

**Treatment.**—The treatment is surgical. If the lesions are single, they may be removed by the curette and the site thoroughly cauterized by the Paquelin or galvanic cautery. When a digit or a portion of one of the extremities is invaded, amputation may be successful in preventing systemic infection. In the case of a young girl reported by Brayton, the disease returned after thorough cauterization and curetting, but was finally checked by dissection of the entire skin and subcutaneous fat at the location of the lesion midway between the knee and the ankle. The patient recovered.

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[1] Indiana Medical Journal, May, 1908.

[2] Transactions of the Indiana State Medical Association, 1907-8.

[3] Journal of the American Medical Association, Jan. 18, 1908, p. 184.

**Prognosis.**—The internal use of potassium iodide, in daily doses of fifteen to sixty grains (1 to 4 gm.), has seemed to have a favorable influence. The prognosis is not favorable; death usually ensues from exhaustion.

DERMATITIS COCCIDOIDES, OR PROTOZOIC DERMATITIS.—This disease described by Wernecke, of Buenos Ayres, in 1890, is closely related to the preceding, and is probably identical with it. According to Montgomery, Morrow, Ophulis and others, the organisms are distinguishable from those of blastomycetes by the peculiarity of the absence of budding, and by endosporulation within the tissues. Pusey remarks the probability of there being several of the yeast and mold fungi, which are pathogenic, and they may produce lesions of great clinical similarity. In this disease, Montgomery states that the skin lesions are similar to those of blastomycosis but differ in the fact that, in most cases, they are developed in the skin after deeper involvement, and also in the fact that all of the cases have been fatal.

HYPHOMYCETIC DERMATITIS, as described by Duhring and Hartzell, is closely allied to the foregoing. The lesions resemble lupus verrucosus and microscopic examination shows mycelial threads and spores.

SPOROTRICHIAL CUTANEOUS AND SUBCUTANEOUS INFECTION.—In this country Shenk and Hektoen, and Perkins, have published cases of infection with *sporothrix,* which are analógous to those just described. Cutaneous nodules and abscesses appeared at the point of infection. Beurman and Gougerot reported a case of a young man in whom these lesions existed upon the upper limbs on the anterior aspect of the forearms. They were small nodosities, subcutaneous, rather discrete, which afterwards ulcerated and became surrounded with a zone of redness, like a boil, only they were almost painless. Subsequently, perhaps by autoinoculation with the nails, lesions were developed in all parts of the body, except the back of the neck, the face and the back of the thorax and trunk, the hands and the feet. At the beginning, the lesion began like a small nodule, painless, resistent, rolling under the fingers, the skin not being visibly elevated. This gradually enlarged and softened producing an abscess, which subsequently discharged, the pus being viscous, reddish and odorless. This was followed by ulceration which lasted a long time.

Bacterial examination of the scrapings reveals the presence of parasitic forms and budding chains; the cultures gave typical specimens of *sporotricha* as described by Beurman. This method excludes syphilis and tuberculosis, the lesions of which might otherwise be mistaken for this disease. The best method of treatment probably is that by iodine internally, especially the sodium or potassium iodide, in doses of 60 grains or more daily. The lesions should be covered with moist dressings containing iodine, as used by Beurman.

## ERYTHRASMA.

Erythrasma is caused by a vegetable parasite, the microsporon minutissimum, which is only one-third the bulk of the microsporon furfur. It does not form groups of spores like the latter.

**Symptoms.**—This superficial parasitic disease of the skin is observed in patches, which gradually spread at the periphery. They originate in situations where there are moist and opposing surfaces, as in the genito-crural and axillary regions. The lesions are faintly red or brown, and the border may be slightly raised and redder than the older portions. The patches may coalesce but rarely spread far over the skin beyond the groin or axilla. There is no vesiculation and little, if any, irritation or itching. It may be distinguished by the microscope from tinea versicolor, pityriasis rosea, and seborrhea.

**Treatment.**—It is also distinguished by its readiness to yield to cleanliness and dry dressings, such as talcum dusting powder containing a little boric acid.

NOTE.—The tropical disease called "pinta," on account of the grayish or bluish color of the lesions, which tend to desquamate, is known to be caused by a fungus of the aspergillus type. The treatment is identical with that of tinea circinata.

## DIPHTHERITIC DERMATITIS.

SYNONYM.—Diphtheria of the skin.

Primary infection of the skin by Loeffler's diphtheria bacillus with a local lesion following, has been observed in a few cases. In a group of five cases reported from the University Clinic at Breslau, all were children from fifteen to thirty months old. Pure cultures were obtained from three of these lesions and their virulence was afterwards successfully demonstrated upon animals.

The lesions were ulcers, which in the beginning were quite small and extremely superficial. Later they became quite large and when multiple they became confluent. The outlines were irrgular. The edges were slightly infiltrated, intensely reddened, and were, in places, somewhat undermined, or with straight edges. The floor of the ulcer was covered with a grayish-white, firmly-adherent diphtheritic membrane. There was very little odor. The lesions were situated especially about the abdomen, groin and genitals. In none of these cases was the mucous membrane affected, and there were no signs of systemic disorder. No toxin could be found in the blood. Exceptionally, the lesion takes on the appearance of ecthyma, owing to mixed infection. In many instances infection takes place at the site of a wound or abrasion.

**Treatment** is simple. The ulcers are to be curetted and then dressed with a mild ointment, containing calomel or boric acid. There is no reason for injecting antitoxin, unless systemic infection should occur.

## ERYSIPELOID.

SYNONYMS.—Erythema migrans—Erythema serpens—Crab cellulitis.

Rosenbach[1] has given the name "erysipeloid" to a condition, which was really first recognized by Morrant Baker in 1873, although Tilbury Fox had previously put on record two cases of similar character. Gilchrist, in 1904, published a comprehensive article on the subject. John H. Jopson has recently noted the occurrence of the disease among laboratory workers[2], from which article this description is taken. "Erysipeloid is an erythematous inflammation, somewhat resembling erysipelas, observed usually on the hands of persons engaged in handling animal products that are liable to putrefaction and decay, especially fish, shell-fish, meats, poultry and cheese. Hence it is commonly encountered in dealers in fish, game and poultry, butchers and cooks." Gilbert reported 329 cases, of which all but six were caused by handling crabs. The lesions may also occur among laboratory workers and medical students, following dissection wounds.

**Etiology.**—The disease is caused by a micro-organism resembling in its early stages a staphylococcus; later it develops mycelium. The threads are long and slender, and tend to form a thick tangled mass, resembling a cladothrix. Inoculation of this organism in the human subject, according to Rosenbach, produces a typical lesion at the end of 45 hours. Gilbert, however, and other recent investigators have failed to confirm this observation. The disease is apparently due to specific infection contained in putrefying animal substances, but the pathogenic organism is still in dispute.

**Symptoms.**—The disease is most frequent among persons handling crabs, but it is also observed among those who deal in shell-fish, in butchers, and laboratory workers. The inoculation may occur at several points. The period of incubation is from a few hours to a week. According to Gilbert's observation the average is two days. A swelling occurs at the point of infection, which gradually spreads. It is of a dark-red color with purple or livid edges. Occurring in a finger it soon affects the entire circumference. The digit is tense, and it is accompanied by itching and burning, but not much pain. It spreads towards the palm, and then to adjoining fingers and the back of the hand. There is no fever and the lymph vessels and glands are not involved. It lasts from ten days to three weeks, but shows a marked tendency to relapse. It is not accompanied by vesiculation, pustulation, or suppuration, and no desquamation follows; but the old skin may be shed, especially if strong antiseptic applications are used.

**Treatment.**—In some cases pressure and protection afforded by ordinary adhesive plaster will effect a cure. Gilbert had good results from salicylic acid plaster. Jopson approves of lead water and laudanum dressings and ichthyol ointment. Iodine has also been used. Flexible collodion might be tried with advantage.

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[1] Microörganismen bei dem Wund-Infektionskrankheiten, Archiv für klin. Chirurgie, 1887.

[2] American Journal of the Medical Sciences, May, 1908.

## TOXEMIC ERUPTIONS.

The eruptive fevers are attended by characteristic lesions of the skin which have been referred to in discussing the diagnosis of various forms of skin diseases, which they may be mistaken for. In addition to the typical forms of eruption, there are others which are not characteristic, like the initial rashes of smallpox, or the gangrenous dermatitis of varicella. Gout and rheumatism produce various forms of toxemic eruptions some of which have been described on preceding pages.

Rheumatism, especially during childhood, predisposes or excites eczema, urticaria, herpes, angioneurotic edema, chilblains, purpura and a special form of psoriasis. The rheumatic child is also especially subject to styes, conjunctivitis, rhinitis, coryza or cold in the head. There is apparent anemia of the skin which is due to peripheral ischemia, and is not caused by deficient hemaglobin in the blood.

PALUDIDES[1]—A term, borrowed from the French—is used by Engman to designate the eruptions associated with malaria, among the more frequent of which is *herpes simplex*. He thinks the herpetic lesions from this cause are more severe and painful than from others. The febrile form with general malarial symptoms is familiar to every one. The non-febrile type is especially noted. Herpes zoster has often been associated with malaria in connection with pompholix, which he considers a vasomotor disturbance of toxic origin. *Urticaria* is, according to Thayer and others, the most frequent eruption in malaria, and there are three types: That accompanying the malarial paroxysm and usually appearing during the febrile stage; that replacing the chill, the other features of the paroxysm remaining; that taking the place of not only the chill but of the entire paroxysm. The later class is the one most frequently seen by the dermatologist. There is nothing peculiar or characteristic about this except its periodicity and evanescence. *Erythema multiforme* has been observed by Engman, and other authors have also noticed similar lesions and albuminuria with casts which, when an eruption is present, may lead to an erroneous diagnosis of both the skin lesions and underlying condition. Several of Engman's cases have had a marked nephritis which cleared up under antipaludal treatment. *Eczema* in its different forms is noticed. *Purpuric eruptions*, while rare, are sometimes observed. His own experience with them was limited to the two cases which he recorded. *Ulceration* and *gangrene* of the skin, associated with malaria, particularly of the estivo-autumnal type, have been reported by several authorities.

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[1] "Paludides: with the Histo-Pathology of a Case of Malarial Purpura." Martin F. Engman. Journal of Cutaneous Diseases, New York.

## CLASS X.

## LESIONS OF THE MUCOUS ME

(*Telæ Mucosæ Anomaliæ.*)

THE skin and mucous membrane are continuo analogous. In each a substratum of connective and yellow elastic fibres, is covered by a layer of richly supplied with blood vessels, lymphatics an papillæ and glands.

The epithelium of mucous membrane is mod the different functions of that tissue. Though no strata as those of the derma, the epithelial cell different situations characterized by more notab than those of the integument. The connective tiss is softer and of looser texture than that of the sk are fewer in number. The glandular element is m in mucous membrane, reaching its highest develop

The inference which may be drawn from a c of structure is strengthened by a knowledge of th logical relationships which exist between the tw digestion is reflected upon the skin in the form of e eczema, and other affections. On the other hand, modifications of its structure, we are often un correspondence in the form of lesion; diseases of accompanied by disease of the mucous membrane. more often than is generally recognized and presen for study, which, nevertheless, has been compar Every general practitioner is familiar with the ch of the mucous membrane in eruptive fevers, in e tuberculosis. The occurrence, under a recogniz pemphigus, eczema and other maladies generally c skin, is frequently unsuspected. The softer and mucous membrane, its higher color, the thinness of its epithelium are circumstances which may of tion of an identical process upon skin and m primary lesions of skin diseases occur upon the often run through their phases with such rapidity only behold a secondary alteration which might causes and which may display no resemblance to which it, nevertheless, represents in the sense of

Purpura hemorrhagica, as the name indicat discharge of blood from outlets of mucous tracts. make its appearance about the same time or a extravasation into the skin. Occasionally ecchyn upon the visible mucous membranes prior to any manifestation upon the skin. The extravasation of blood may occur from the mucous membrane of the respiratory, gastro-intestinal or genito-urinary tract. In addition to the more usual manifestations, hemorrhage may take place into serous cavities, the substance of viscera and the medullary cavities of bones. The gums are generally covered with blackish scabs beneath which the mucous membrane is pale. Henoch, Hewé and others have described a form under the title of purpura fulminans or purpura foudroyant, occurring in children, rapidly fatal without hemorrhages from mucous surfaces. A case met with by Dr. Henry Jackson,[1] of Boston, would seem to belong to the same type, as death resulted upon the fourth day. This case was distinguished, however, by severe hemorrhages from the nose, stomach, bowels and bladder. The patient was a boy, five years of age, who had lately entirely recovered from a mild attack of measles. In purpura rheumatica, also, we may witness, in addition to gastro-intestinal disturbances, as colic, vomiting and diarrhea, hemorrhage from the stomach or bowels. An extraordinary case was observed by Dr. J. H. Thompson, of Kansas City, Mo. A girl eight years of age was attacked by purpura rheumatica. The inner surface of the lips and anterior half of the tongue were covered with a herpetic eruption which formed a continuous mass upon the mucosa and extended to the skin of the chin and nose. At first yellowish white in color, it became, within twenty-four hours, black with extravasated blood. At the same time, a suppuration iridocyclitis attacked both eyes. Constitutional symptoms were severe. The child eventually recovered but remained permanently blind.

Dr. Audubert has reported[2] from the clinic of Professor E. J. Moure a case of purpura of the mucous membrane of the mouth, pharynx and larynx. The patient, a man fifty-nine years of age, had been under treatment for laryngeal tuberculosis, for two months, when disseminated spots of purpura made their appearance in the mouth and pharynx. They were of a vivid red color, did not project beyond the surface nor disappear upon pressure. They were found upon the soft palate, tongue and right ventricular band, were not painful to the touch and caused no difficulty in swallowing. Ten days after they were first observed they had nearly disappeared and were undergoing changes of color indicating resolution of the extravasations. But as the first crop was removed new patches developed upon the inner surface of the left cheek, the gums and the posterior region of the pharynx. No lesions of the kind were present upon the skin. The nasal mucous membrane was normal in all its parts. The purpura in this case was doubtless the result of tuberculosis.

The distinctive affections of the mucous membrane are universally recognized as constituting an essential feature of the disease in measles, scarlet fever and rötheln. Though the catarrhal inflammation in measles presents no analogy of form to the coarsely papular and crescentic eruption upon the skin, a somewhat closer parallelism is observed in scarlatina, where the inflammation of the throat is, prior to ulceration, of the diffuse erythematous type similar to the efflorescence upon the skin. The ulceration may, perhaps, be compared to the desquamation and loss of hair and nails upon the outer surface.

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[1] Archives of Pediatrics, December, 1890.

[2] Annales de Polyclinique de Bordeaux, No. 5, 1891.

In variola the eruption as seen upon the mucous membranes bears a more marked resemblance to the typical manifestation upon the skin. During the period of invasion there may already be seen upon the pharynx and tonsil a dull redness of color with points of elevation which subsequently become distinct papules. Both vesicles and pustules can be distinguished in the buccal cavity. Owing to their situation the pustules are of limited duration and their epithelial covering soon yields, exposing an ulcerated surface. The lesions of variola simplex may appear upon the pharynx, larynx, bronchia and other mucous surfaces, and may excite bronchitis or pneumonia. In the confluent form of the disease the fauces, pharynx, larynx and tongue become swollen and covered with pustules, and edema of the glottis may result. The conjunctiva is often attacked. In malignant small-pox the appearance of the mucous membrane bears a resemblance to the atypical and hemorrhagic rash upon the skin. The buccal and pharyngeal mucous membrane is covered by a purulent hemorrhagic exudation. Hemorrhage from the stomach, nose and bowels is not infrequent. Professor J. Nevins Hyde, of Chicago, speaks[1] of an autopsy made by himself upon the body of a male subject dead of unmodified variola. In this case there was no portion of the alimentary canal from the mouth to the anus which was not studded with thickly set pustules. Typical vesicles of varicella may develop upon the conjunctiva or roof of the mouth, upon the inner side of the cheek, the tongue or palate.

In addition to its specific effect upon Peyer's patches, the poison of typhoid fever usually gives rise to bronchitis and, not infrequently, to pharyngitis or laryngitis. No analogy can be drawn between these manifestations and the rose colored spots which appear upon the skin.

Erysipelas not infrequently affects the mucous membrane of the nose, mouth, pharynx, larynx, trachea or vulva. Erysipelas of the larynx is usually an extension from the face or nose though it may co-exist with the same disease in some more distant part. In erysipelas of the fauces, the tongue, pharynx and larynx are swollen and death may take place suddenly from edema of the air passages. Occasionally erysipelas makes its first appearance upon some mucous surface. In the great epidemic of erysipelas which prevailed widely throughout Canada and the United

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[1] Pepper's System of Medicine, vol. i, p. 539.

States in the years from 1842 to 1846, the disease generally began in the throat and fauces or simultaneously in these parts and upon the face and head. In some instances the disease is confined to a mucous surface. An interesting case has been observed by M. Mosny,[1] in which a primary erysipelatous broncho-pneumonia developed in a servant girl after two days' attendance upon her master who was suffering from facial erysipelas. Bacteriological examination and cultures revealed the presence of the streptococcus of erysipelas without mixture of any other organism.

It is well known that syphilis in any stage may attack the mucous membrane. The initial lesion develops at the spot where the infecting material gained entrance to the system. This may be within the urethra, upon the tongue, tonsil, conjunctiva or within the verge of the anus. The ulcers of late syphilis may form in any portion of the alimentary tract, in the nose, larynx, trachea or bronchi. In the secondary period of the disease a correspondence can be traced between the lesions of the skin and mucous membrane. Erythema of the nose, throat or vulva is analogous to the erythema of the skin with which it generally co-exists. The mucous patch is the counterpart of the condyloma.

The mucous membrane may be affected in erythema multiforme, and occasionally inflammation of the throat occurs a few days before the appearance of the eruption upon the skin. The slight fever, gastric disturbance and other constitutional symptoms which generally precede an attack of erythema nodosum are, in some instances, accompanied by soreness of the throat. In the course of the disorder nodules may form on the tongue or mucous membrane of the mouth and pharynx, and may cause so much pain and difficulty in swallowing as to interfere with nutrition.

The close relation which exists between digestive disturbances and urticaria is universally recognized, but the fact that urticaria may attack a mucous membrane is, prehaps, not so generally known. Wheals may develop in the mouth, pharynx, upon the tongue or epiglottis. Cases of the kind have been observed by Kaposi, Cayla, Bock, Laveran, Sevestre, Hutchinson and others. Dr. A. Cayla contributed a paper to the International Congress of Dermatology and Syphiligraphy held at Paris in 1889, describing a case of acute febrile urticaria with laryngeal and gastric crisis. He was called to attend the patient, a woman 65 years of age, who was suffering from dyspnea. The patient was subject to an itching and a general eruption. The face was congested, the respiration frequent, the voice extinct. Several such attacks had occurred during the day and coincided with violent itching of the integument and the development of wheals. Upon the succeeding day the condition remained the same, but on the third day the embarrassment of respiration disappeared though the woman was afflicted with gastric derangement. This phenomenon also was preceded by a violent itching of the skin. There was a sensation of burning and constriction along the esophagus.[1] Dr. Bock[2] reported a case of urticaria of the tongue, which suddenly swelled until it filled the buccal cavity, was bluish in color, bright and glistening, hard and elastic in consistence. There was burning pain but no abnormal heat. The diagnosis rested upon the rapid development, the peculiar appearance of the tongue, and the knowledge that the patient was subject to attacks of urticaria. Jonathan Hutchinson mentions[3] the case of a man, aged about 39 years, who, soon after a sudden eruption of tingling and swelling upon the integument was attacked by great edema of the uvula and soft palate. Subsequently the tongue swelled, and still later the patient experienced pain in the epigastrium with a sense of obstruction in the esophagus. These symptoms continued for about a week. Urticaria of the mouth or epiglottis may occasion symptoms of asphyxia.

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[1] Le Progrès Médical, Feb. 15, 1890.

The characteristic lesion of lichen planus, though seldom developed upon the face, may attack the mucous membrane of the tongue, mouth or pharynx. In two instances Dr. L. D. Bulkley, of New York, has seen them appear primarily upon the glans penis. Dr. Feulard has reported[4] two cases, one of a man, aged 30 years, and another of a woman, 59 years of age, in whom, though the eruption upon the skin assumed different phases, the manifestation upon the mucous membrane was identical in appearance. In the man the inner surface of the cheeks was affected. In the woman both cheeks and tongue were attacked.

Herpetic eruptions frequently appear upon mucous membranes. The fever blister or cold sore is familiar to every person. Herpes facialis may also attack the conjunctiva. Owing to the delicate structure of the epithelial layer, together with the heat and moisture characteristic of mucous membranes, the vesicles in these situations soon rupture exposing excoriations covered with a purulent fluid or with a yellowish or brownish crust. Professor Fournier has called attention[5] to the fact that apparently cured syphilitic patients are often subject to recurrent attacks of herpes of the tongue. The lesions are small, scattered, of short duration and seem not to be of syphilitic origin since they are aggravated rather than benefited by special medication. They are thought to be due, in fact, to prior irritation of the mouth by mercury, and the use of tobacco. Dr. J. H. Thompson, of Kansas City, Mo., has observed[6] the rare association of herpes iris with croupous conjunctivitis. The eruption upon the integument was very abundant. The conjunctival sac was entirely filled by a croupous membrane, which glued the lids together and to the eyeball. Herpes progenitalis is common and is often mistaken for a syphilitic manifestation. The differential diagnosis may become especially puzzling in the female, in which the labia may be immensely swollen, the vesicles may coalesce and rupture. An offensive odor may develop and the condition may be additionally complicated by enlargement of the inguinal glands due to the severity of the inflammation. Occasionally, herpes manifests itself in the vagina or upon the neck of the womb.

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[1] Congrès International de Dermatologie et Syphiligraphie tenu à Paris en 1889; Paris, 1890, p. 780.

[2] Clinique de Bruxelles, May 1, 1890.

[3] Archives of Surgery, 1889-90, i, p. 369.

[4] Annales de Dermatologie et de Syphiligraphie, May 25, 1890.

[5] La Semaine Médicale.

[6] Kansas City Medical Record, November, 1889.

Herpes gestationis may involve the mucous membrane. Liveing saw a case of herpes which originally appeared during gestation, but in which relapses subsequently occurred in the absence of pregnancy. In two of these relapses the mucous membrane of the mouth was severely affected.

Cases of herpes sometimes occur in which so much constitutional disturbance accompanies the eruption that they may appropriately be described as herpetic fever. In such cases the lesions are generally located upon a mucous membrane, as that of the mouth, conjunctiva or genitalia.

A vesicular eruption which sometimes appears upon the tongue, mouth or throat and which has been described under the name of herpetic angina appears, at least in some instances, to be identical with herpes zoster. The vesicles may coalesce, rupture and leave an erosion or ulcer. Dr. B. Pouzin publishes[1] an account of two cases of herpetic angina with vesicular lesions which correspond in situation to the course of various mucous and cutaneous branches of the trifacial nerve.

The bullæ of pemphigus may form upon mucous membrane. That variety of acute pemphigus which occurs principally among children and sometimes as an epidemic in infants, is apt to be complicated with purulent conjunctivitis. Since the publication of Steffan's paper in 1884 it has become recognized that pemphigus of the conjunctiva may give rise to the so-called essential xerosis, or shrinkage of the conjunctiva. In addition to the case observed by himself, Steffan collected the histories of fifteen patients which had been reported by others, and similar cases have been subsequently met with by Schmidt-Rimpler, Bäumler and Deutschmann. Professor Deutschmann's observation related to an old lady, 71 years of age, in whom a typical process of xerosis was associated with pemphigus of the conjunctiva and roof of the mouth.

The fatal and, fortunately, very rare form of the disease termed pemphigus vegetans usually begins with pain in the mouth from formation of bullæ upon the mucous membrane. In a few days or weeks similar lesions develop upon the skin. In some instances the larynx and conjunctiva have been attacked. Hydro-stomatitis is the name bestowed by M. Quinquaud upon certain lesions occurring upon the mouth and throat of a young woman. Upon the hand were so trace of erythema. Both the lesions in the mo hand were bullous from the beginning. Their panied by a febrile attack.[1]

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[1] Revue de Laryngologie, d'Otologie et de Rhinologie, March 1, 1891.

In an exhaustive report to the International and Syphiligraphy, held at Paris, in August, 188 varieties which have been classified under the na primitive generalized exfoliative dermatitis. In dermatitis proper, or the sub-acute form, the mu involved. Conjunctivitis, coryza, stomatitis and been observed.[2] In a case of universal pityriasis O. C. McNary, of Leavenworth, Kansas, in "Th March, 1892, the mucous membrane of the mouth the tongue was thickened and fissured. The eyes and there was some photophobia.

Eczema of the tongue is occasionally encou especially connected with gastro-intestinal dera ment upon the tongue is essentially similar to may assume very fantastic contours, and Bes seborrheic eczema. Eczema of the vulva may extend as far as to the neck of the uterus.

Dermatitis herpetiformis has been seen upon th membrane of the mouth, throat and nose. The di its first appearance in the mouth.

Psoriasis very seldom invades a mucous mem however, upon the prepuce.

Rhinoscleroma generally begins upon the se It is, in fact, more peculiarly a disease of mucou skin. The disease may originate in the pharynx has been recorded in which it started from the ha

In the lupus erythematosus disseminatus p mucous membrane of the gums and cheeks Professor W. A. Hardaway, of St. Louis, Mo., has erythematosus with unusual complications, which the disseminated variety of Kaposi.[3] About commencement of the malady, the patient was se of the face and neck, and of the lymphatic gland difficulty in swallowing. The throat was edemato ulceration. The eruption declined; the swelling but the glands suppurated; tuberculosis superve long delayed.

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[1] Revue de Laryngologie, d'Otologie et de Rhinologie,
[2] Edinburg Medical Journal, 1890, ii, p. 814 *et seq.*
[3] Journal of Cutaneous and Genito-Urinary Diseases,

M. Vidal observed a case in which lupus erythematosus began at about the same time upon the hairy scalp and within the mouth. A patch extended along the inner surface of each cheek, from near the commissure to the lower molar teeth. In the centre was a depressed patch of redness, encircled by a whitish border, forming festoons and branches. The white border was in slight relief, and apparent to sight and touch. The lesions were not painful, though there was some prickling, and a slight degree of pain upon eating.[1]

Lupus of the mucous membrane is precisely the same process as when it invades the skin. According to Dr. Max Bender, who has analyzed a series of 380 cases treated in the clinic of Professor Doutrelepont, of Bonn, in 31.2 per cent. the mucous membrane was invaded before the disease appeared upon the skin.

Tuberculosis more commonly affects mucous membrane than skin, though, in addition to lupus vulgaris, several distinct varieties of cutaneous tuberculosis have been indicated.

A case of Addison's disease has been reported, in which no bronzing of the skin occurred, but the mucous membrane was pigmented. The discoloration of the mucous membranes, in jaundice, I need but to mention.

In tubercular leprosy, macules and tubercles develop upon mucous as well as cutaneous surfaces. The deposit may take place in the mouth, nose, throat, larynx, and upon the tongue, epiglottis and conjunctiva. The uvula and the epiglottis may be partially destroyed, the voice loses its tone, and becomes harsh. The tongue may become swollen and cracked, and edema and ulceration of the glottis may occur. In the anesthetic variety, anesthesia of the mucous membrane of the mouth and pharynx was present on both sides in ten per cent. of the 330 cases examined by Dr. Castor. In but a few cases was the anesthesia limited to one side. Anesthesia of the conjunctiva is frequent in all varieties of leprosy.

Xanthoma tuberosum has, at times, been observed upon the palate, trachea, and lining membrane of the gall-ducts.

That the achorion Schönleinii may develop upon a mucous membrane with which it comes in contact, is demonstrated by the case of Kundrat. The fungi, conveyed from the patient's fingers to his food, and then into his mouth, attached themselves to the mucous membrane, and produced the characteristic cup-shaped crusts, which were clearly recognized in the post-mortem examination. Favus cups have also been observed upon the gastric mucosa.

I need merely allude to the frequency with which epithelioma invades mucous surfaces as a primary manifestation.

The lesions of melanotic cancer also have been observed upon mucous membranes.

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[1] Annales de Dermatologie et de Syphiligraphie, 1889, 2 Ses., x, p. 785.

## LEUCOPLAKIA.

**SYNONYMS.—Leukoplakia buccalis—Leukokeratosis buccalis—Ichthyosis linguæ—Tylosis linguæ—Leucoplasia—Psoriasis of the tongue.**

In leucoplakia, white, slightly indurated patches form upon the tongue or inside of the cheeks, which, after attaining a certain size, remain stationary, and become a little thicker, or more like horns. Small lesions may coalesce to form large ones.

**Symptoms.**—Leucoplakia begins upon the tongue or inner surface of the lips or cheeks, according to Schwimmer, Mauriac, and Vidal, in the form of a red, circumscribed, hyperemic spot or spots. Around these spots or upon their surface, some of the papillæ may be seen to be slightly swollen. This may be termed the first, or erythematous, stage. After an uncertain duration of weeks or months, its aspect changes. The redness is succeeded by a pearly white, bluish, or grayish color. At the same time, the epithelium of the affected area becomes thickened.

Butlin, Debove, Nedopil, and other writers have failed to recognize this early stage of redness, and describe the lesions as of a whitish or bluish hue from the beginning of the disease. One of our own writers, Dr. John S. Marshall, of Chicago, shares this view,[1] stating that, in his own observation, the disease begins in the form of whitish patches. Leucoplakia does not usually come under the physician's care until it has been in existence for a long period; yet, nevertheless, a case is occasionally seen which presents the erythematous stage. Of this phase Lacoarret records an example. He was consulted by a man, upon the anterior and left half of whose tongue were several round patches of a somewhat darker shade of red than the surrounding surface. One month later, the color had deepened a little; five or six months then passed without examination. During this interval a marked change had occurred. The spots had enlarged, coalesced, and assumed the characteristic aspect of leucoplakia.

If the disease has begun in a number of initial spots, these at length become confluent and form a single lesion, which at first remains red at its periphery. In contour the patches are round, oval, or oblong. Shallow transverse or longitudinal grooves divide the surface into a series of polygonal patches. In certain cases, the disease assumes the form of a band, from half to three quarters of an inch in breadth, sometimes rough and slightly elevated, and in other instances smooth, and seated upon the mucous membrane of the cheek.

The progress of the disease is attended by flaky desquamation due to the successive reproduction of epithelium. This feature was so prominent in one of Besnier's cases that the patient was greatly embarrassed by the necessity of scraping from his tongue thick epidermic flakes. The desquamation is a fact of diagnostic importance. The surface of the patches gradually becomes cornified, hard, rough, and the constant movements of the tongue may produce fissures, especially on the borders. These fissures can be rendered more apparent by making traction upon the tongue. At this time, the condition has been likened to a cat's tongue. Vidal regards this as the second stage of the disease. In the course of time more or less deep ulceration may take place. All these features may sometimes be perceived coexistent in the same case.

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[1] Journal of the American Medical Association, February 25, 1899.

In the later course of the disease papillomatous growths may develop from the affected locality, and, finally, it is very apt to degenerate into epithelioma.

The duration of the disease is extremely indefinite. An existence of twenty years is not uncommon, and, according to the history of the first case which I have herein recorded, it may persist for nearly twice that length of time without ulceration or malignant transformation.

From the beginning of the disease the affected part is somewhat swollen. If the tongue is involved its movements are clumsy and speech is embarrassed. Its venous circulation becomes obstructed, especially at the lower surface and lower border. The organ becomes enlarged and considerably deformed.

As a rule leucoplakia begins upon the tongue and spreads secondarily to the cheek. In a case which I have reported this order seemed to have been reversed. The lower surface of the tongue is rarely attacked. In one of Besnier's cases the pharynx and larynx were implicated. The disease may, in fact, affect other mucous membranes.

In an early stage of the malady, normal sensibility is little, if at all, disturbed. At a later period, the lesion becomes sensitive, particularly to contact with hot or acid liquids, alcohol, highly seasoned food, etc. The sense of taste, however, is not changed. At first there is a feeling of dryness in the mouth, but subsequently there is abundant salivation.

The rate of progress may not be uniform. At times the disease may remain stationary or even recede. It may then awaken to renewed activity.

It must be acknowledged that recognition of leucoplakia at an early date, prior to the development of the characteristic pearly hue and keratinization of the epithelium, is by no means easy. As a mater of fact, the physician seldom observes a case at this period. The absence of subjective symptoms will very often, if not generally, prevent the patient from noticing its presence before the development of the discoloration, desquamation, and roughness. Not long since I found a patch of leucoplakia upon the tongue of a physician, who was totally unaware of its existence.

**Pathology.**—Leucoplakia appears to be essentially a chronic inflammation of the mucous membrane, with infiltration, localized cellular hyperplasia, and keratinization of the epithelial layer. The hyperplasia begins around the vessels, whence it spreads to the corium and papillary

layer. There is an infiltration of young cells in
of the corium and summits of the papillæ. The
papillæ is increased. In mild cases, or in an ea
be distinctly recognized. At a later period
destroyed by the general infiltration of embryon
papillæ are flattened or atrophied, and thus res
The proliferated cells of the corium encroach to a
those of the epidermis.

The embryonal cells accumulate also in t
glands of the mucous membrane. The epitheli
wise proliferated.

The upper layers of the epidermis undergo a
while the cells of the Malpighian layer exhibit
as a whole is markedly thickened.

The infiltration of the tissue and the comp
vessels produce the elevation and the whitish col

With the concurrence of fissures comes the
formation into epithelioma. From the edges
of the Malpighian layer penetrate deeply into
themselves into the epidermic nests characte
carcinoma.

**Etiology.**—The principal exciting cause of leu
irritation. This irritation is generally due to the
It is commonest in men and between the thirtieth
Schwimmer's youngest patient was twenty-three,
years of age. A small minority of cases has
and children. A broken tooth or an ill-fitting
same effect. The disease not infrequently begins
ing to the crowns of prominent upper or
excessive use of condiments, alcohol, and
potassium and mercury, are also mentioned as

Constitutional conditions are thought
influence. A considerable proportion of cases oc
M. Barthélémy asserts that he has witnesse
leucoplakia, in only fifteen of which could syphil
the significant statement that a man had come
for thirty years had smoked thirty cigars a day
of leucoplakia. He contracted syphilis and tw
considerable area of leucoplakia. Zambaco, of
that, although he lives in a country where ever
never observed a well-marked case of leucoplak
That the affection does not necessarily depend
shown by the fact that the subject of leucoplaki
has been witnessed by Schwimmer and Debo

own cases attest, it may occur in persons entirely free from the history, symptoms, or signs of syphilis.

In other instances lithemia, diabetes, or gastro-intestinal disorder, has been present. I have witnessed its occurrence in patients long afflicted with gastro-intestinal catarrh. Vidal states that "most of the patients have personal or hereditary antecedents of rheumatism, gout, or gravel." Hertzka[1] observed several cases, in women as well as in men, in which the disease of the tongue seemed to be excited by chronic gastric or gastro-intestinal catarrh. One of his male patients was also an excessive smoker.

In some cases, leucoplakia has been observed to follow an attack of typhoid fever or measles. Heredity and consanguinity have also been cited as predisposing causes. In all such instances we may presume that the mucous membrane is unusually susceptible to an assault of chronic inflammation.

It was once thought that those female patients who suffered from leucoplakia were in the habit of smoking, as is not uncommon in Flanders and some other countries, and among certain classes. This may, indeed, be true of some, but it cannot apply to all cases. Moreover, although the mouth is its common seat, leucoplakia is not absolutely confined to that locality. It has been detected in the larynx, nose, and middle ear. Schwimmer has seen it upon the mucous membrane of the vulva. Case XIII of the series published in his original paper[2] is headed: Leucoplakia lingualis et buccalis; leukoplakia vulvæ. The patient was a woman, fifty-six years of age, who had had leucoplakia of the mouth for several years. "The mucous membrane of the labia majora is in spots deprived of its epithelium and, together with the dark red surfaces exposed, are thick white heaps of epithelium. The right and left labia minora as far as the vaginal entrance are similarly altered and exhibit superficial erosions with infiltration. There is a creamy secretion from the vaginal mucous membrane, the vagina is very sensitive and painful, and permits no examination by the speculum in order to ascertain the condition of the uterus." The same author had the opportunity of witnessing a second case in which the vulva was involved as well as the mouth.

In recent years, also, the same condition has been discovered upon the mucous membrane of the urinary bladder. Brick[3] describes forty-one cases of vesical leucoplakia which he was able to recognize by the use of the cystoscope. In this situation it is the consequence of long-continued inflammation, especially of a gonorrheal character. It often gives rise to papillomatous or glandular neoplasms. Hallé has likewise written on the same subject, more particularly in relation to a cancerous termination.[4]

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[1] Deutsche medizinische Wochenschrift, 1880, vi, 157.

[2] Vierteljahrschrift für Dermatologie und Syphilis, 1877, iv, p. 511, *et seq.*

[3] Wiener medizinische Presse, 1896, Nos. 36, 37.

[4] Archives ann. genurin, 1896, pp. 481, 577.

He concludes that the normal epithelium of the bladder may become transformed into layers of flat epithelial cells of an epidermoidal nature, and that in certain cases the leucoplakia assumes the features of epithelioma. The presence of this disease in the living subject was described by Cabot, and has since been witnessed by a number of observers. It has also been seen in the vagina and upon the uterus. Apart from its own individuality leucoplakia is interesting historically on account of the confusion which long existed as to its nature and relationship. It claims our earnest study, furthermore, by reason of its tendency to terminate in epithelioma. The earlier writers compared the disease of the tongue to ichthyosis, psoriasis, and even to more distant affections of the integument. Alibert has described a case as ichthyosis of the tongue, occurring in a person attacked by generalized ichthyosis. Rayer has witnessed, in an otherwise healthy man, a morbid development of papillæ of the tongue, resembling ichthyosis. Samuel Plumbe, an English writer on diseases of the skin, made use of the same term. Hulke denominated his cases buccal ichthyosis. Bazin and others have made use of the term buccal psoriasis. So long ago as 1858, it was designated tylosis linguæ, and this term has been retained by Lailler and Fairlie Clarke to designate a special form of leucoplakia terminating in epithelioma. In France it has also been described under the title of "*tâches des fumeurs*" (smoker's patches).

The name by which we now know the disease was given it by the late Professor Schwimmer, who had made it the subject of an elaborate study.[3] Vidal prefers the term leucoplasia, and Hutchinson has written of it under the title leucoma.

Occurring in association with psoriasis of the integument, leucoplakia was formerly considered identical with the latter disease. Professor Joseph Ransohoff, of Cincinnati, speaks of having witnessed one case in which lingual and cutaneous psoriasis coexisted. The patient was a man, thirty-three years of age, who had long been subject to attacks of cutaneous psoriasis, and upon whose forehead and breast punctate spots were present at the time of examination. The entire left side of the tongue to the line of the circumvallate papillæ, but not involving the anterior half inch, was occupied by a dense leucomatous patch; the tongue had been involved for three years. On the contrary, Besnier, of Paris, has found so few instances of the coexistence of leucoplakia and psoriasis, that he denies any relationship between the two affections. Out of more than a thousand cases of psoriasis, he has never met with one in which that disease was present upon both the skin and the mucous membrane of the mouth. Lewin has denied that psoriasis ever attacks the tongue. A number of esteemed authors coincide in this opinion. The question hinges largely upon whether we should regard leucoplakia of the

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[1] Vierteljahrschrift für Dermatologie und Syphilis, 1877, iv, p. 511, *et seq.*

mucous membrane as equivalent, histologically and pathologically, to psoriasis of the skin. This is a matter still unsettled, but there can be no doubt that leucoplakia and psoriasis may coexist. Dr. Lacoarret, of Toulouse, has reported[1] an interesting case in which psoriasis and leucoplakia were simultaneously developed. The patient, a man, fifty-eight years of age, consulted Lacoarret on account of throat trouble. He had been a great smoker. He had never suffered from syphilis. He had experienced several attacks of psoriasis, in the last of which, beginning three months previously, the tongue had become painful, at the same time that the eruption appeared upon the skin. Upon the tongue, especially on its anterior portion and toward the right border, was a series of rounded, smooth, bluish white spots. A fissured and slightly ulcerated lesion of the same kind was seated upon the right border of the tongue.

In 1885, Schuetz, of Frankfurt on the Main,[2] had under his care a strong and otherwise healthy boy, ten years of age, who had been afflicted with psoriasis since his second year. A brother, a sister, and a father were subject to the same disease. In one attack, when the eruption upon the skin had notably faded, there appeared a milk-white patch at each corner of the mouth, and a large, pearly white patch involving the inner surface of the right cheek and the roof of the mouth; streaks of similar aspect existed upon the inner side of the left cheek. The child had good teeth, was free from syphilis, digestive disorder, anemia, or scrofula, and the leucoplakia could not be due to the use of tobacco, as he had never used the article. The same writer also refers to a woman in whom an obstinate leucoplakia had preceded an outbreak of psoriasis of the integument, but endured after the latter affection had disappeared. This patient, likewise, had never smoked or had syphilis. In a third case observed by Schuetz, leucoplakia of the left cheek occurred in a woman aged twenty-two years, who had been troubled by psoriasis since her eighth year. Schwimmer, in a series of twenty cases, has recorded two in which leucoplakia coexisted with psoriasis in the same patient. Vidal, Lailler, Lang, Neisser, Pospelow, Polotebnoff, Kutznitsky, and other authors, have described cases of coincident psoriasis of the skin and mucous membrane. In the case cited by Kutznitsky, from the Strassburg clinic, psoriasis of the lip extended to the mucous membrane. Sack has observed psoriasis continued from the eyelid to the conjunctiva. Lang has witnessed an obstinate chronic conjunctivitis associated with a universal psoriasis which involved even the eyelids. Notwithstanding this impressive array, Schwimmer and Neisser agree with other authorities in looking upon the association as accidental, or, as Mercklen suggests, at most due to a common predisposition rather than to an identity. From this view Schuetz dissents, pointing out that, as psoriasis may produce neuralgia and asthma, it may equally implicate mucous membranes, and concluding that, when leucoplakia occurs in conjunction with hypertrophic proliferation of epithelium, as in psoriasis, tyloma, and chronic squamous eczema, the association depends upon a common origin. In a case mentioned by Du Castel, a man who had never smoked had been the subject of leucoplakia since he was twelve years of age. In eight cases reported by Dr. Marshall, the patients were all men who were habitual smokers, most of them to excess. Dr. Warren cites the case of a lady on whose tongue leucoplakia had existed from youth, but it disappeared in old age.

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[1] Revue Hebdomadaire de Laryngologie, d'Otologie et de Rhinologie, July 9, 1898.

[2] Archiv für Dermatologie und Syphilis, 1898, p. 433, *et seq.*

Neligan was the first to notice, in 1862, the occurrence of cancer as a sequence to leucoplakia. The same termination was observed in Hulke's case of "ichthyosis of the tongue." Debove, in his thesis, in 1873, laid stress upon this eventuality, and wrote: "It is impossible to establish a relationship between the gravity and extent of the squamous lesion and the advent of the epithelioma. It develops sometimes on tongues where the squamous lesion occupies the entire surface of the organ, and again upon those which display but one or two spots." The malignant transformation may occur early or late. Schwimmer has seen one case in which epitheliomatous transformation took place at the end of six months and another at the end of two years. On the contrary, in one of the cases which I have described there was no malignant degeneration after a duration of forty years; and in a second case a suspicious nodule existed independently on the lower lip.[1]

In the male, leucoplakia has also been seen on the glans penis. An interesting case of the kind was reported by Professor Le Dentu to the Academy of Medicine, on behalf of M. Aucher and M. Binaud, of Bordeaux. Two analogous cases have been recorded by Perrin, of Marseilles. The patient, who was forty-four years of age, had a coexisting pediculated epithelioma and a patch of leucoplakia of the balano-preputial groove and glans. Le Dentu believed that the epithelioma had developed from the leucoplakia. He had also observed a case of temporary leucoplakia of the glans, which had been preceded and determined by an attack of balanoposthitis; the same patient was attacked, more than eight years later, by a leucoplasic epithelioma of the tongue, underwent an early operation, and the disease recurred.[2]

Epitheliomatous change is most common on the tongue. It is now generally recognized that epithelioma may result from many varieties of persistent irritations of skin or mucous membrane. Indeed, epithelioma is not unknown as a sequence of psoriasis of the integument. Tillaux and Cartaz have observed the change from psoriasis into epithelioma. K.

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[1] New York Medical Journal, Nov. 23, 1901.

[2] Medical Bulletin, December, 1899, p. 452.

Schuchardt has recorded a case in which epithelial cancer developed from a psoriasis preputialis of six months' standing.

**Diagnosis.**—The disease is a peculiar affection which bears little resemblance to those ordinarily occurring in the mouth. They must be differentiated from the lesions of *syphilis*. As regards mere color, the lesions in these cases might suggest a thought of the mucous patch. The latter is one of the commonest disorders of the mouth. Its favorite seat is the inner surface of the lips and cheeks and upon the tongue. Its grayish color has been compared to the stain left by silver nitrate upon the mucous membrane. It is slightly, if at all, elevated above the surrounding level. The mucous patch readily ulcerates.

Though this manifestation of syphilis is extremely frequent, persistent, and recurrent, it is amenable to special treatment. Under this influence it disappears, although it recurs again and again when the treatment is neglected. The mucous patch makes its first appearance in the early secondary stage of syphilis and coexists with other evidences of the constitutional infection. This lesion, however, never continues alone for so long a period as ten years, to say nothing of thirty-five or forty, without ulceration or other change. Neither is it accompanied by desquamation. Usually, there is no history of syphilis and not the slightest indication upon other parts of the body, of the past or present existence of that disease.

The lesions of late syphilis may easily be eliminated. These are far more common upon the tongue than upon the cheek. They consist of scleroses of gummata. Syphilis of the tongue always affects the upper surface and is usually situated along the middle line. Syphilitic sclerosis is attended by more marked induration than exists in leucoplakia.

Gummata develop in the first place as tumors in the substance of the tongue. If allowed to progress, they break down to form ulcers, which are located upon the upper surface of the organ. In syphilis of the mouth we can usually obtain a history or other signs pointing to the nature of the disease.

*Tuberculous* ulcers of the tongue generally occur toward its tip. They have sharply defined margins, the granulations are pale and flabby, and there is but little surrounding induration. Tuberculosis in this situation is usually a secondary process, and we can find evidence of the same disease in other parts of the body, notably in the lungs.

There is a form of *cancer* which attacks the tongue. After a short duration it becomes an ulcer which readily bleeds and involves neighboring parts. Epithelioma is habitually attended by severe pain, irrespective of the food, and by characteristic induration. The average duration without operation scarcely exceeds eighteen months.

Long-continued irritation, as, for instance, that due to the custom of smoking tobacco, may give rise to a chronic superficial inflammation of the tongue. In such cases, however, there is little desquamation, and the disease is often accompanied by lesions at the commissures of the lips and inner surface of the cheeks.

Glass-blowers are subject to *opaline patches* within the mouth, due to compression of the air and constant irritation. Such patches are constituted by macerated and accumulated epithelial cells, and always occur upon both sides of the mouth. They disappear when the man is out of work. They never ulcerate. These features distinguish opaline patches of glass-blowers from the lesions of leucoplakia.

Leucoplakia, in fact, bears no resemblance to epitheliomatous, tuberculous, or lupous ulcers. There is no ulceration but a rough, irregular surface of silvery white color, the seat of constant desquamation. Epithelioma and tuberculosis lack the pearly white appearance. Though the mucous patch of syphilis and the opaline patch of glass-blowers have a similar color, yet their other characteristics differ from those presented by leucoplakia.

**Treatment.**—The patient should be counselled to give up tobacco and alcoholic drinks, to avoid hot food, acids, and condiments. If a bad tooth seems to be the cause of the trouble, it should be extracted or its cavities filled and its edges rendered smooth. If an ill-fitting plate is worn, it should be discarded and a more nearly perfect article be procured. Antiseptic and alkaline mouth washes are useful. An application consisting of one-half-per-cent. corrosive-sublimate and one-per-cent. chromic-acid solution has been recommended by Schwimmer. The same writer has advocated the local use of papaine, one part being dissolved in ten parts each of distilled water and glycerin. In a case affecting the upper lip and tongue, H. Niemeyer, by the application of this solution once every day, obtained complete healing of the tongue and decided improvement of the lip in seventeen days. Sherwell claims speedy improvement after the application, two or three times a day, of undiluted mercuric nitrate, protecting the adjacent parts with absorbent cotton and neutralizing with sodium bicarbonate and glycerin. Zambaco likewise states that he has secured good results in mild cases from applications of the same mercuric solution. By other authorities a two-per-cent. to ten-per-cent. solution of potassium bichromate is employed. The balsam of Peru is considered a beneficial application by some authors. Pure lactic acid in ten-per-cent. solution, a ten- to thirty-per-cent. solution of salicylic acid, and a twenty-per-cent. solution of potassium iodide are among other agents which have been employed.

Cauterization of the lesion is advised by some and discountenanced by other authorities. The thermo-cautery, galvano-cautery, and solid stick of silver nitrate have been made use of for this purpose. Dujardin-Beaumetz wrote approvingly of a suggestion put forth by Köbner, of Berlin, who administered belladonna prior to the operation, in order to check supersecretion of the saliva, which will rapidly remove the eschar. Dujardin-Beaumetz refers to cases which have been cured by this method.

On account of its tendency to end in epithelioma, however, I am in accord with those who advocate a cautious local therapy and the avoidance of escharotic measures. If the lesion is ulcerated and fissured, if it has resisted mild local treatment, and, above all, if enlarged glands are detected in its vicinity, it is judicious to have recourse to a surgical procedure. The nature of the operation must be governed by the circumstances of the case. In a number of instances, Ransohoff has practiced with encouraging results an operation which he terms decortication—*i. e.*, the removal of as much of the cortex of the tongue as is necessary for the radical cure. This writer states that recovery takes place speedily, and, in a few weeks, normal epithelium is reproduced upon the denuded surface. In some cases, which he had the opportunity of examining several years after the operation, it was impossible to determine, by inspection or touch, any cicatricial tissue. The same term, decortication, had been employed by Trillat and Verneuil in 1880.

The general treatment of the disease must be regulated according to the predisposing causes. If the patient is syphilitic, he should be placed upon anti-syphilitic remedies, although these have no influence upon the leucoplakia in the absence of active syphilis. Digestive disorders, lithemia, etc., should be managed upon general principles. In some of this class of cases Hertzka saw a cure from a course at Carlsbad.

## GLOSSITIS AREATA EXFOLIATIVA.

**Synonyms.—Areata linguæ exfoliativa—Pityriasis linguæ—Erythema linguæ migrans—Transitory benign plaques of the tongue—Circinate or ringworm-like eruption of the tongue—Wandering rash—Geographical tongue.**

This condition, usually found in children under two years of age, only exceptionally in adults, consists of superficial lesions, in the form of spreading, scaly patches, upon the dorsal surface of the tongue. According to the stage of the disease and the varying degree of hyperemia on one hand, or scaliness on the other, the color of the lesions varies in different places. The border may be red, or it may be whitish or yellowish from the accumulation of the scales. The lesion may be single or multiple; the areas, when numerous in their development, often assume gyrate outlines (geographical tongue).

**Clinical Symptoms.**—Usually the growth is unattended by subjective symptoms, or there is slight itching only. The lesions are apt to appear near the border of the tongue, and spread on to the dorsum in a half circle. Those developing on the dorsum assume an irregular round or oval shape. Sometimes after the lesion has attained a considerable size, a new lesion may develop in the centre and this may be repeated, so that an "iris" form may result. The lesions rarely extend to the under surface of the tongue. The patches increase rapidly in size, but do not last more than a week or two, when they disappear, and the tongue returns to its normal condition. Relapses are liable to occur, and the disease is usually chronic.

**Etiology.**—The cause of this condition is not known. It has been attributed to gastric disturbance and indigestion. It is not due to syphilis. It may be a trophoneurosis as claimed by Unna. It has been thought to be parasitic in its origin but no fungus has yet been identified as the cause. In some instances a hereditary tendency has been observed. After debilitating illness, it may appear, but it is also often seen in healthy individuals. Parrot considers the condition as essentially inflammatory, and as associated with parakeratosis. Besnier claims that it is a form of seborrheic eczema.

**Treatment.**—Occasional painting of the surface with tincture of iodine, or the etherial solution of iodoform, or balsam of Peru, is useful, with daily use of mouth washes containing unirritating antiseptics, such as the alkaline antiseptic solution of the Pharmacopeia. The intestinal tract must be carefully watched, and the diet regulated. The internal use of arsenic has been advocated by Hartzell and others, but this should be employed only for a short time, and after the stomach and intestinal tract are in good condition.

**Prognosis.**—The general health is unaffected and the lesion usually disappears if hygiene of the mouth be observed and disorders of digestion are corrected. There is a possibility of the subsequent development of epithelioma, as in Paget's disease of the nipple.

## HYPERKERATOSIS LINGUÆ—LINGUÆ PLICATA.

Two conditions of the tongue may be here briefly mentioned, viz: *Hyperkeratosis linguæ*, black tongue or hairy tongue, and *lingua plicata*, fissured, wrinkled or scrotal tongue. The first named is due to a hyperkeratosis of the papillæ. Its color is usually black, but may be a dirty yellow or bluish. The papillæ may be greatly elongated and may resemble hairs. The favorite site is on the middle of the dorsum of the tongue, and consists of one large patch. This may disappear in a few weeks, or may persist for years. The disease is rare and its cause unknown. The treatment is palliative and hygienic. The blackened condition of the dorsum of the tongue due to the administration of some preparations of iron, need not be mistaken for this condition, which is supposed to be parasitic in its origin. In the second named condition, *lingua plicata*, the tongue appears to be slightly swollen, and its surface is grooved with rather deep furrows, giving it an appearance like that of the scrotum, when contracted by cold. Occasionally, irritation may be caused by food lodging in the grooves, but ordinarily no subjective symptoms are produced. The condition is usually congenital, and may be hereditary.

although it may not develop its characteristic appearance until adult life. The condition is permanent. It may readily be diagnosticated from syphilitic or tubercular lesions, or scarring of the tongue following such lesions, by a careful examination of the tongue and the absence of any appearance or history of ulceration. No treatment is required, beyond the ordinary measures to secure cleanliness.

## STOMATITIS GANGRENOSA.

SYNONYMS.—Noma—Cancrum oris—Gangrenous sore mouth.

A severe variety of stomatitis, affecting young children especially, marked by the development of a spreading ulcer on the mucous membrane, and by gangrene. It is attended by general prostration of the bodily powers, and is generally fatal. A similar lesion may attack the external genitals (*noma pudendi* and *noma vulvæ*). It may occur in the course of acute diseases, such as chicken-pox, measles, or typhoid fever.

**Etiology.**—Microscopic study has failed to distinguish any typical form of micro-organism. Schimmelbusch has demonstrated a streptothrix in the lesions of noma. Jensen found a bacillus which he named the bacillus necroseos, which is said to be identical with the bacillus necroseos of Salomonsen, and Loeffler's bacillus vibulorum. Krahn found comma-shaped bacilli, Weaver and Tunnicliffe found an invasion with fusiform bacilli and spirilla. Levi and Sailer detected a Klebs-Loeffler bacillus in pure culture. Moser reports finding protozoa in three cases of noma. Gangrene of the uvula and soft palate has been caused by Vincent's bacillus, as described by Bruce.[1] Blumer and MacFarlane[2] in an epidemic of measles followed by noma, report that in nine cases studied bacteriologically, the colon bacillus was found in all; and in addition an organism that resembled a leptothrix. Bruning has reported finding a cladothrix. Pus organisms are also present. Randle C. Rosenberger, of Philadelphia, has made a bacteriological study of seven cases. Foremost and most abundant was the spirillum and fusiform bacillus of Vincent. Next in frequency were diphtheria-like organisms, streptococci, staphylococci, and, in a couple of cases, pneumococci. The fusiform bacillus and the spirillum of Vincent were the most abundant organisms present in the smears. It appears, therefore, that there is no typical form of bacterium in the disease. Rosenberger concludes that it is due to a symbiosis of a number of bacteria, the principal ones being the symbiotic organisms of Vincent.

**Symptoms.**—The disease comes on insidiously, and the ulceration makes considerable progress before gangrene occurs. Toxemia subsequently develops and the disease goes on to a fatal termination. The

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[1] Lancet, Oct. 12, 1907.

[2] New York Medical Journal, Feb. 1, 1908, p. 200.

soft tissues of the lips and cheeks are progressi
great loss of tissue and mutilation. In other cas
the groin are the site of the disease. In addition
in the soft parts the process may extend to the j
become thrombosed thus preventing hemorrhage fi
neighboring lymphatics became enlarged and so
pneumonia, or gangrene from inhalation of g
from metastasis, may be met with in the lun
described a peculiar and fatal form of gangrene
young babes, appearing only a few days after birth

The disease attacks girls more frequently
between two and five year of age. It appears en
regions like Holland. Overcrowding, bad hygie
nutrition favor it.

The lesion appears as a dark ragged sloughi
membrane of one cheek near the corner of the
develops in the cheek and brawny induration of
soon manifest. This quickly breaks down showing
tion of the cheek may occur on the third day or
The characteristic gangrenous fetor is present.
over all of one side of the face, including the gu
bilateral. Toxemia, prostration, delirium, fever
death occurs in one or two weeks.

**Diagnosis.**—The diagnosis is based upon the
course of the lesion, assisted by the history of mea
some other infectious fever of childhood. *Anth*
adults, and is accompanied by the bacillus anthra
charges. Ulcerative stomatitis may be distingui
necrosis and sloughing, no perforation of the cheek
principally affected. In mercurial stomatitis,
sloughing, and the gums are swollen and the teeth l

**Treatment.**—After removal of the sloughs
galvano-cautery or the Paquelin cautery, or the s
lens, may be resorted to under anesthesia. Chlo
acid nitrate of mercury, silver nitrate, phenol, or
been used to assist the separation of the slough.
succeed if the antiseptic solutions be frequentl
copper, hydrogen dioxide, potassium permangana
coal poultices are preferred by J. M. Anders. I
aid in healing the granulating surfaces. Antistre
successfully used in a case of noma by W. C. Ca
and nourishing food are needed, and rectal feed
After recovery, plastic operations may be able t
deformity.

**Prognosis.**—The disease is usually fatal when occurring in poorly nourished children. The mortality is from 80 to 90 per cent. The resulting deformity from cicatricial contraction in those that recover, causes ectropion and other repulsive mutilation.

## PERLÈCHE.

A painless, contagious disease, affecting the lips, especially the commissures, in children, has been studied in Europe, particularly in France. (Fr. *perlècher*, to lick.) According to Justin Lemaistre, who first described the disease, in 1885, it is due to a specific organism which he named streptococcus plicatilis. Raymond found the staphylococcus cereus albus which he regards as the cause. The disease occurs in institutions especially, and is communicable.

**Symptoms.**—It begins as a whitish patch upon the inside of the lips, with some tendency to scaling. The epidermis soon becomes macerated and broken, showing a reddened, moist surface, discharging serous fluid. The patches may appear at both corners of the mouth, and spread towards the median line; but do not involve the entire mucous surface of the lip. They spread also over the skin of the lips to a moderate extent. Fissures may be observed at the commissures. The disease often disappears spontaneously after a few weeks, or months, but may recur.

**Diagnosis** from syphilitic lesions of the mouth (mucous patches), in infants, is difficult from the appearance alone, but the absence of other evidences of syphilis, the occurrence of several cases in the same house, and the course of the disease will assist in recognizing this condition.

**Treatment** is by isolation. Auché has found the most efficacious local application to be a solution of chromic acid (five per cent.).[1] The use of antiseptic washes for the mouth, and mild ointments will aid recovery. Prophylactic treatment requires looking after the nursing bottles, spoons and articles which children are likely to place in their mouths.

**Prognosis** is favorable but recovery may be delayed by relapses.

## RHINOPHARYNGITIS MUTILANS.

SYNONYMS.—Destructive ulcerative rhinopharyngitis—Gangosa (Spanish).

A disease of tropical countries, notably of Fiji, Philippines, Guam, British Guiana, the West Indies and Hawaii, which attacks the mucous membranes lining the nose and mouth and extends to neighboring structures, causing ultimately much deformity owing to destruction of the septum and hard palate, and loss of the nose and adjacent parts by ulceration.

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[1] Journal de Médicine de Bordeaux, March 25, 1906.

**Etiology.**—Dr. James F. Leys,[1] surgeon in th report to the Surgeon-General, in 1904, was t denominate this as a distinct disease and to se yaws, syphilis or tuberculosis. There is eviden produced by some parasitic growth like that w dermatitis and Madura-foot; but it has not yet what infectious micro-organism (or symbiosis o responsible for this terribly deforming disease.

Dr. Still, of the United States Navy, has wit a case at Canacoa. Musgrave and Marshall ha in a male Filipino, who had never been away f They made careful examination of the scrapin without success in discovering the parasite. The was given of the absence of the organisms of culosis.

**Pathology.**—As *Granuloma mutilans oris,* described the disease called, in South America, "Es be identical with gangosa. It is a granulating, ulc ing in the mucous or cutaneous margin of the li lip, and extending into the nose, involving the alæ ing the hard and soft palates. Perforation and to frightful mutilation of the face, while for a lo of the patient remains apparently unimpaired.

This disease has been observed only in America, and in the Hawaiian Islands. It i Race is a predisposing cause as the patients o Indians or half-castes. They were from 12 to 5 evidently infectious, the pathogenic micro-organi identified. It appears by the therapeutic test t potassium iodide makes no impression upon it.

**Symptoms.**—Senn[2] observed that the disease mestizos. It occurs in both sexes. "The gro consists in a granulomatous process which begin neous margin of the lip, in preference the upp are pale and glossy, and their breaking down which soon involves the alæ of the nose, and th spots appear on the hard and soft palates, wh perforated. The lymphatic glands are not invol

"The destructive process remains limited to causes frightful mutilation of the face, while fo health of the patient remains apparently unimpa tagious, very chronic and incurable, the patients thirty years from some intercurrent disease. The local conditions bear some resemblance to syphilis and lepra, or to a combination of these two diseases."

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[1] Reprint from Journal of Tropical Medicine, Feb.

[2] Journal of the American Medical Association, Ja

**Prognosis** is unfavorable as to improvement or cure; but life may be prolonged and the general health may remain good for many years, while the local disease slowly progresses.

**Treatment.**—The use of antisyphilitic remedies is not productive of favorable results, as far as the local disease is concerned. If seen early, probably the x-ray treatment would be successful in arresting the disease. The use of diluted hydrogen dioxide frequently, as a mouth wash, and other antiseptic agents may be serviceable. Applications of tincture of iodine, guaiacol, or salicylic acid might be made with a brush to the affected part. A change of residence, and improved hygienic care, would be advisable in most instances.

## SPOROZOIC INFECTION OF THE NOSE.

Jonathan Wright, of New York, described a peculiar granuloma, or papillomatous growth in the nasal chambers, showing a marked disposition to return after removal. The lesions sprang from the mucosa of the turbinals and also from the septum. They had the appearance of soft hypertrophies, forming a soft, projecting, papillomatous, pendulous mass.

After removal, section showed the presence of protozoa, which Wright identified as the Rhinosporidium kinealyi. In all cases observed, the organism has occurred in granulation tissue, near the vestibule of the nose, which suggests the inference that the infection was carried by the finger nail. Very minute white dots were seen on the surface of the growth, when sectioned, and with the low power these are recognizable as small spheroid cysts imbedded in granulation tissue. The condition resembles the coccidoidal granulomata of Hektoen; but in this case, which was reported by Wright,[1] and which occurred in the practice of E. C. Ellett, of Memphis, Tennessee, there was no evidence of metastasis. The treatment adopted by Dr. Ellett was simply removal with a snare. No return occurred at the original location, but two similar growths appeared and were similarly removed, one year later.

## LABIALIS MYXADENITIS.

SYNONYMS.—Cheilitis glandularis apostematosa.

This disease consists essentially of a hypertrophied and dilated condition of the mucous glands of the lips, which may or may not be attended with inflammation of the surrounding mucous membrane, or of the skin.

The patient suffers no pain or inconvenience, other than from the

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[1] New York Medical Journal, Dec. 21, 1907, p. 1149.

annoyance of the unsightly condition of the
discharge of tenacious mucus which glues th
Upon examination, the surface of the lips is ob
reddened and rough; the glands are swollen an
from which the glairy mucus is seen to exude.
duced into the orifices of some of these glands.
elongated and tortuous so as to form sinuses.
superficial abscesses may be formed. Streptococ
of the skin of the vicinity, may be secondarily in

The disease was first described by Volkn
occurrence, and its cause is unknown. Un
treatment, the disease was very rebellious to tre
may be expected from the judicious use of th
between treatments, which should not be more fr
a mild astringent antiseptic ointment should b
surface, such as the ordinary oxide of zinc o
acetate ointment.

The prognosis is favorable, if the proper trea
early period of the disease; but after it has ex
very resistant to treatment, on account of second

## LABIALIS PSEUDO-COLLO

SYNONYM.—Pseudo-colloid of th

In this disease the free surface of the li
white or yellowish growths, not larger than a pi
are smaller. They are sessile or scarcely proj
Upon making the mucous surface thinner by str
are more easily recognized. They are deposite
mucous membrane and are usually discrete, but
as to form a continuous lesion of a whitish yell
extend into the mouth, especially at a level
interval between the teeth. They are usually
The condition is not very unusual. It has been
among men than women, and has exceptionally

Fordyce, who first described[1] this conditio
evidence of granular degeneration of the cells
C. J. White,[2] who has carefully reviewed the
opinion. Others, however, notably Montgome
recently shown that the condition results fr
sebaceous glands, which are normally present in
suggested by Pusey that the disease may be

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[1] Journal of Cutaneous Diseases, 1896, p. 413.

[2] *Loc. cit.*, March, 1905.

(embryonic) or acquired tendency to excessive development of these glands. The diagnosis is not difficult. *Xanthoma,* attacking the mouth, causes distinct characteristic tumors of a yellow color. No treatment has been devised for this condition, which is permanent.

The prognosis is unfavorable as far as cure is concerned; but the lesion itself is usually harmless.

## APHTHÆ OR STOMATITIS APHTHOSA.

SYNONYMS.—Angina aphthosa—Follicular stomatitis—Aphthous stomatitis.

Aphthæ, a form of catarrhal stomatitis, (Gr. ἄφθα, an ulcer), is seen usually in children from two to four years of age, and not rarely among adults. It is characterized by an eruption of one or more vesicles upon the tongue, lips, or inside of the cheeks. These soon are transformed, by rupture, into small round or oval discrete spots, that are slightly raised. Their bases are yellowish white, and they are surrounded by narrow red areolæ.

The **etiology** of this condition is not explained by a single agency. There are many predisposing causes such as the season of the year (spring and autumn), a poor condition of general nutrition of the patient, and unhygienic surroundings. Dentition, digestive disorders, anemia, tuberculosis, the eruptive fevers are recognized as predisposing causes. The exciting causes may be local irritation, and especially that produced by micro-organisms, which are common in the air, the food and the drink. No special parasite has been connected with this disease. Bednar's aphthæ is probably an instance of mixed infection (possibly diphtheritic).

There are often more or less marked constitutional symptoms, fever, loss of appetite, diarrhea, and general malaise may be observed. In Europe, among babies suffering with marasmus, a severe form known as Bednar's aphthæ has been observed. In this variety, large white patches form upon the hard palate commencing on each side near the teeth and gradually spreading over the surface. These may break down into ulcers, and from that lead to destruction of bone. This disease is usually fatal.

The **diagnosis** of aphthæ from thrush will be easily made with the microscope and also owing to absence of vesicles and constitutional disturbance in the latter. Herpes of the mouth may be identical with aphthæ.

The **treatment** is simple. Local measures consist in use of alkaline antiseptic washes, and in touching the spots with cocaine or phenol solution. Chlorate of potassium lozenges may be used by older patients. The general symptoms are met with an ordinary antipyretic mixture, correction of disorders of digestion by calomel and magnesium powders, and a suitable diet. In many cases tonics will be required, especially those containing iron.

## STOMATITIS MYCOSA.

**Synonyms.**—Thrush—Parasitic stomatitis—Croupous stomatitis—Stomatite crèmeuse pultacée (Fr.).

A disease of the mouth accompanied by the formation of small, rounded, soft, whitish patches, which tend to spread and coalesce at their edges. A specific form of thrush is caused by the growth of the saccharomyces albicans; this is a mycelial formation which sends its filaments into the deeper layers of the mucosa and into the glands. It may spread over the entire interior of the mouth.

The disease is usually encountered in poorly nourished and bottle-fed children, especially where not sufficient care is given to the preparation and administration of the food, and to the disinfection of the bottle after feeding. The growth is favored by an acid condition of the mouth and by uncleanliness. It is communicable, by the use of cups or spoons, and may be endemic in infants' asylums.

A microscopic examination of the patches shows a mass of interlacing mycelial filaments, occasional spores, bacilli and leptothrix elements.

The mouth is dry and hot, and patches of livid appearance are seen, covered to a greater or less extent, with whitish, curdy, soft crust, which later may become darker colored owing to some slight hemorrhage. At first they are adherent to the mucosa, but later loosen and may be brushed off, leaving a smooth surface. The growth may return in successive crops after removal. There are no marked symptoms of a general character, although the child may be restless or a little feverish.

The *treatment* is local and general. The mouth should be cleansed with application of diluted hydrogen dioxide and Dobell's solution. Alkalies are used to overcome the acid condition of the mouth. Rubbing the lesions with borax and sugar is an old expedient for babies. The mouth may be sprayed frequently with an alkaline antiseptic, to overcome the dryness. Weak solutions of nitrate of silver (3 to 5 per cent.) may be carefully applied after fungus has been cleared away. The general treatment should be restorative with chalybeates, tonics and cinchona, or cod-liver oil with hypophosphates etc.

## SYPHILIS ORIS.

The primary and secondary lesions of syphilis are frequently seen upon the mucous membrane of the lips and the interior of the mouth, including the tongue and pharynx. Perhaps they are more annoying when in this location than upon the genitals, because more conspicuous and more likely to be brought to notice.

Syphilis in general has been discussed on a previous page. The present consideration is for the purpose of directing attention to the possibility of this being the explanation of some doubtful cases. The existence of a syphilitic history and the presence of other luetic lesions are confirmatory evidence, which should be sought after carefully.

The primary lesion is produced by direct inoculation. What has been called *syphilis insontium,* or syphilis of the innocent, may be acquired from drinking cups, pipes, glassblowers' tubes or by osculation. The sore is usually of slow development and course, has very little secretion (contains the treponema pallidum), and the edges are undermined. The glands at the angle of the jaw become swollen and tender, and the secondary eruption may be observed upon the skin. The secondary lesion, or mucous patch, is often seen on the tonsils, pillars of the fauces, tongue or mucous membrane of the cheek.

They are to be distinguished from *simple aphthous patches* which are associated with indigestion, and from smoker's patches, and leucoplakia buccalis. Lichen planus of the mouth can easily be excluded by their flattened appearance and lead-white color, and the subsequent appearance of the characteristic lesions upon the skin.

**Treatment.**—Under treatment, local and constitutional, the syphilitic lesions usually promptly disappear. They may be painted once or twice with solution of nitrate of silver (5 to 10 per cent.), and dusted with iodoform daily. Antiseptic solution (U. S. P.) can be used for a mouth wash, if well-diluted, with great advantage. Internally the iodides are most useful usually, but some cases require mixed treatment (see page 286).

## MORBI CATARRHALES—CATARRHAL AFFECTIONS.

**Synonyms.—Inflammationes catarrhales—Inflammations of mucous membrane with discharge—Influenza—Colds in the head.**

Increase of secretion to an abnormal degree is the constant result of inflammation of a mucous membrane succeeding the preliminary condition of congestion, or hyperemia, when the surface for a time may be unusually dry. The secretions are altered in character as well as in quantity and may be watery and serous, fibrinous, pseudo-membranous, muco-purulent, or bloody, according to circumstances. The condition is usually manifested locally or within certain limits, and receives a special designation from the anatomical part affected; thus the mucous membranes of the eye and eyelids present conditions of dacrocystitis, conjunctivitis and tarsal conjunctivitis or blepharitis; the nose and adjacent cavities furnish clinical examples of rhinitis, sinusitis, ethmoiditis, etc. The mouth and throat supply us with the terms stomatitis, gingivitis, pharyngitis, tonsillitis, naso-pharyngitis, laryngitis, chorditis, tracheitis, bronchitis, etc. Inflammation of the ear gives otitis and myringitis. A number of similar appropriate appellations are afforded by inflammations of the genital organs, such as balanitis, urethritis, vaginitis, vulvitis and the like. The discharges always contain, besides the secretion of the mucous follicles, epithelial débris,

leucocytes (red blood-cells sometimes) and nume
saprophytic forms being constant. The latter a
ciated with specific and other non-specific p
catarrhal condition, therefore, is frequently co
being directly dependent upon the virulence of the
present, and likewise it depends upon the fav
culture ground to which they are to be transmitt
certain times of the year, may assume an epidemi

**Etiology.**—The causes of inflammation of m
same, generally speaking, as those of the skin, a p
being afforded by the moist or partly moist surfa
the protective epithelial layer which favors abs
Epidemic catarrhal conditions are generally ac
specific microörganisms, especially the pneumococ
bacilli of Pfeiffer, or of Klebs-Loeffler, the bacill
produce vasomotor catarrh or hay-fever; epidem
eye; la grippe or influenza; glanders; diphtheria,
are essentially catarrhal inflammations *plus* a spe
or another. The presence of an excess of ozo
irritating vapors in the air, will also produce cat

**Symptoms.**—To the ordinary symptoms of in
heat and swelling, when mucous membranes are
ment of function, and characteristic discharge w
contagious or inoculable, depending upon the char

**Diagnosis.**—Increased discharge of mucus m
and in such cases the mucous membrane looks ed
not inflamed. The characters of the various *speci*
recognized both clinically and microscopically.
may be diagnosticated by their history and clinical

**Treatment.**—The treatment should be both g
the former, physiologic and hygienic methods
health are useful adjuncts; and tonics and rest
are often equally necessary in breaking up a cata
be summed up as cleanliness, by means of mild
(to prevent further infection, or irritation, thro
and finally, the judicious employment of antisep

The official antiseptic, or the alkaline antise
acid solutions are useful in catarrhal affections o
teaspoonful of hydrogen dioxide solution in half
cleansing mouth wash. A combination of sod
borate, and white sugar, a teaspoonful of which
cupful of hot water, is largely employed as a no
treatment of specific catarrhal inflammations, s
belong within the scope of this treatise.

# FORMULARY.

## *INTERNAL.*

### ABSCESSUS—CUTANEOUS ABSCESSES.

| | | |
|---|---|---|
| Take of Tincture of pokeroot (phytolacca) | 100 minims. | 6. |
| Tincture of prickly-ash bark (xanthoxylum) | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls in water three or four times a day.

### ABSCESSUS—CUTANEOUS ABSCESSES.

| | | |
|---|---|---|
| Take of Sulphide of calcium | 40 grains. | 2.60 |
| Extract of belladonna leaves | 2 grains. | 0.12 |

Mix and divide into twenty pills.

Dose: A pill three or four times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Sulphide of arsenic | 1 grain. | 0.06 |
| Extract of gentian | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Syrup of hydriodic acid | 2 ounces. | 64. |
| Syrup of lactucarium | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls three times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Extract of Indian hemp | 4 grains. | 0.24 |
| Extract of nux vomica | 4 grains. | 0.24 |
| Lupulin | 30 grains. | 2. |

Mix and divide into thirty pills.

Dose: Two pills morning and evening.

### ACNE.

| | | |
|---|---|---|
| Take of Pancreatin | 40 grains. | 2.60 |
| Bicarbonate of sodium | 90 grains. | 6. |

Make into fifteen powders.

Dose: One powder after meals.

### ACNE.

| | | |
|---|---|---|
| Take of Pill of carbonate of iron | ½ drachm. | 2. |
| Nux vomica extract | 2 grains. | 0.12 |
| Arsenic trioxide | 1 grain. | 0.06 |

Mix and divide into twenty pills.

Dose: One pill after meals.

### ACNE.

| | | |
|---|---|---|
| Take of Liquid pepsin (N. F.) | 2 drachms. | 8. |
| Tincture of nux vomica | 1 drachm. | 4. |
| Dilute hydrochloric acid | 2 drachms. | 8. |
| Glycerin | 2 ounces. | 64. |
| Mint-water | 1 ounce. | 32. |

Mix. Dose: One teaspoonful after meals.

### ACNE.

| | | |
|---|---|---|
| Take of Bromide of sodium | 4 drachms. | 16. |
| Syrup of wild cherry | 3 ounces. | 96. |

Mix. Dose: One teaspoonful in water every three hours.

### ACNE.

| | | |
|---|---|---|
| Take of Sublimed sulphur | ½ ounce. | 16. |
| Carbonate of magnesium | 6 drachms. | 24. |

Mix and divide into twelve powders.
Dose: One or two powders in syrup every morning and evening.

### ACNE.

| | | |
|---|---|---|
| Take of Syrup of lactate of iron | 3 ounces. | 96. |
| Chlorate of potassium | 2 drachms. | 8. |

Mix. Dose: One teaspoonful four times a day.
Efficacious for pustular acne.

### ACNE.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 100 grains. | 6. |
| Aromatic powder | 100 grains. | 6. |

Mix and make into twenty capsules.
Dose: One capsule three to four times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Tincture of capsicum | 1 drachm. | 4. |
| Bicarbonate of sodium | 100 grains. | 6. |
| Peppermint-water | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Glycerin | 3 ounces. | 96. |
| Fliud extract of calamus | 2 drachms. | 8. |
| Cinnamon-water | 14 drachms. | 56. |

Mix. Dose: Two teaspoonfuls three or four times a day.
Useful in acne punctata, or black-head.

### ACNE.

| | | |
|---|---|---|
| Take of Fluid extract of hydrastis | 2 drachms. | 8. |
| Glycerin | 3 ounces. | 96. |

Mix. Dose: One teaspoonful before meals.

### ACNE.

| | | |
|---|---|---|
| Take of Sulphate of iron | 15 grains. | 1. |
| Extract of dandelion (taraxacum) | 20 grains. | 1.30 |

Mix and divide into twenty pills.
Dose: One pill after meals.

### ACNE.

| | | |
|---|---|---|
| Take of Extract of ergot | 1 drachm. | 4. |
| Extract of gentian | 24 grains. | 1.45 |
| Purified aloes | 48 grains. | 3.20 |
| Soap | 12 grains. | 0.75 |

Mix: Divide into twenty-four capsules.
Dose: One capsule three times day, after each meal.

### ACNE.

| | | |
|---|---|---|
| Take of Syrup of the lactophosphate of lime | 3 ounces. | 96. |

Dose: One teaspoonful in water three times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Syrup of the hypophosphites | 5 ounces. | 160. |
| Aloin | 2 grains. | 0.12 |

Mix. Dose: One teaspoonful three times a day.

### ACNE.

| | | |
|---|---|---|
| Take of Sulphide of calcium | 10 grains. | 0.65 |
| Citrate of iron and quinine | 20 grains. | 1.30 |

Mix. Divide into ten capsules.
Dose: One capsule after each meal.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Sulphurous acid | 2 ounces. | 64. |
| Syrup of orange-flowers | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls in water three times a day.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Tincture of nux vomica | 2 drachms. | 8. |
| Solution of arsenite of potassium | 2 drachms. | 8. |

Mix. Dose: Five to ten drops in water two or three times a day.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Corrosive sublimate | 1 grain. | 0.06 |
| Glycerin | 3 ounces. | 96. |

Mix. Dose: One teaspoonful four times a day.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Tincture of chloride of iron | 5 drachms. | 20. |
| Solution of arsenite of potassium | 100 minims. | 6. |
| Solution of citrate of ammonium, a sufficient quantity to make | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Compound syrup of phosphates | 3 ounces. | 96. |
| Diastasic extract of malt | 3 ounces. | 96. |
| Glycerin | 2 ounces. | 64. |

Mix. A dessertspoonful two or three times a day.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Phosphide of zinc | 1/10 grain. | 0.006 |
| Extract of nux vomica | 1 grain. | 0.06 |
| Powdered capsicum | 1 drachm. | 4. |

Mix and divide into thirty pills.
Dose: From three to four pills daily.

### ALOPECIA.

| | | |
|---|---|---|
| Take of Tincture of pilocarpus (jaborandi) | ½ ounce. | 16. |

Dose: Five to thirty drops in water four times a day.

### ALOPECIA CIRCUMSCRIPTA.

| | | | |
|---|---|---|---|
| Take of | Oxide of zinc | 2 grains. | 0.12 |
| | Arsenate of sodium | 1 grain. | 0.06 |
| | Extract of nux vomica | 2 grains. | 0.12 |
| | Lupulin | 1 drachm. | 4. |

Mix and divide into thirty pills.

Dose: One pill three to four times a day.

### ALOPECIA CIRCUMSCRIPTA.

| | | | |
|---|---|---|---|
| Take of | Sulphate of strychnine | 1 grain. | 0.06 |
| | Diluted phosphoric acid | ½ ounce. | 16. |
| | Elixir of cinchona | 7½ ounces. | 240. |

Mix. Dose: One teaspoonful in water thrice daily.

### ALOPECIA CIRCUMSCRIPTA.

| | | | |
|---|---|---|---|
| Take of | Sulphate of quinine | 40 grains. | 2.60 |
| | Powdered capsicum | 10 grains. | 0.60 |
| | Arsenic trioxide | 1 grain. | 0.06 |

Mix and divide into twenty pills.

Dose: One pill after meals.

### ALOPECIA CIRCUMSCRIPTA.

| | | | |
|---|---|---|---|
| Take of | Spirit of glyceryl trinitrate (nitro-glycerin a one-per-cent. solution in alcohol) | 1 drachm. | 4. |

Dose: One drop in water three to four times a day.

### ANIDROSIS.

| | | | |
|---|---|---|---|
| Take of | Infusion of pilocarpus | 3 ounces. | 96. |
| | Spirit of nitrous ether | 3 ounces. | 96. |

Mix. Dose: One to two tablespoonfuls every three or four hours.

### ANIDROSIS.

| | | | |
|---|---|---|---|
| Take of | Compound syrup of sarsaparilla | 3 ounces. | 96. |
| | Tincture of stillingia | 2 ounces. | 64. |
| | Spirit of nitrous ether | 2 ounces. | 64. |

Mix. Dose: One tablespoonful three or four times a day.

### ANTHRAX.

(Malignant pustule.)

| | | | |
|---|---|---|---|
| Take of | Compound tincture of cinchona | 3 ounces. | 96. |
| | Solution of acetate of ammonium | 3 ounces. | 96. |
| | Brandy | 3 ounces. | 96. |

Mix. Dose: One tablespoonful in water every two or three hours.

### ANTHRAX.

| | | | |
|---|---|---|---|
| Take of | Creosote | 2 minims. | 0.12 |
| | Hydrate of chloral | 2 drachms. | 8. |
| | Syrup of ginger | 3 ounces. | 96. |

Mix. Dose: Half to one teaspoonful in water every three or four hours.

### BITES AND STINGS OF INSECTS.

| | | | |
|---|---|---|---|
| Take of | Oil of sassafras | 2 drachms. | 8. |

Dose: Two to ten drops on sugar, or in syrup, every two to four hours.

### BITES AND STINGS OF INSECTS.

| | | |
|---|---|---|
| Take of Tincture of aconite | 2 drachms. | 8. |

Dose: One to two drops in water every two to three hours.

### BITES AND STINGS OF INSECTS.

| | | |
|---|---|---|
| Take of Infusion of digitalis | 2 ounces. | 64. |
| Spirit of nitrous ether | 2 ounces. | 64. |
| Brandy | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls in water every two to three hours.

### BITES AND STINGS OF INSECTS.

| | | |
|---|---|---|
| Take of Aromatic spirit of ammonia | 1 drachm. | 4. |
| Tincture of capsicum | 1 drachm. | 4. |

Mix. Dose: Ten to thirty drops in water every two hours.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Sulphate of quinine | 30 grains. | 2. |
| Sulphide of calcium | 10 grains. | 0.60 |

Mix and divide into twenty pills.

Dose: One or two pills every three or four hours.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Tincture of chloride of iron | 1½ ounce. | 48. |
| Glycerin | 1 ounce. | 32. |
| Syrup of red orange | 1½ ounce. | 48. |
| Sulphate of quinine | 1 drachm. | 4. |

Mix. Dose: One teaspoonful in water every two or three hours.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Carbonate of ammonium | 2½ drachms. | 10. |
| Fluid extract of coffee | ½ ounce. | 16. |
| Syrup | 4 ounces. | 128. |

Dose: One or two teaspoonfuls every two or three hours.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Antipyrin | 100 grains. | 6.50 |

Make into twenty powders.

Dose: One powder in water every one or two hours.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Betanaphthol | 15 grains. | 1. |
| Carbonate of iron | 15 grains. | 1. |

Mix and divide into fifteen pills.

Dose: One pill three to four times a day.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 3 drachms. | 12. |
| Syrup of hydriodic acid | 2 ounces. | 64. |
| Glycerin | 6 ounces. | 192. |

Mix. Dose: One tablespoonful in water three to four times a day.

### CHANCROID.

| | | |
|---|---|---|
| Take of Bromide of sodium | 10 drachms. | 40. |
| Tincture of aconite root | 40 minims. | 2.60 |
| Tincture of hops | 5 ounces. | 160. |

Mix. Dose: One to two teaspoonfuls in water every two or three hours until relieved.

### CHANCROID.

| | | |
|---|---|---|
| Take of Tartrate of iron and potassium | 4 drachms. | 16. |
| Aromatic spirit of ammonia | 2 drachms. | 8. |
| Water | 3 ounces. | 96. |

Mix. Dose: One teaspoonful in water every three hours.

### CHANCROID.

| | | |
|---|---|---|
| Take of Sulphate of quinine | 30 grains. | 2. |
| Powder of ipecacuanha and opium | 30 grains. | 2. |

Mix and divide into thirty pills.

Dose: Two pills every two or three hours.

### CHANCROID.

| | | |
|---|---|---|
| Take of Syrup of iodide of iron | 1 ounce. | 32. |
| Chlorate of potassium | 2½ drachms. | 10. |
| Glycerin | 2 ounces. | 64. |
| Water | 1 ounce. | 32. |

Mix. Dose: One to two teaspoonfuls every two or three hours.

### CHANCROID.

| | | |
|---|---|---|
| Take of Tartrate of antimony and potassium | 2 grains. | 0.12 |
| Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: One to two pills every three to four hours.

### CHLOASMA—PIGMENTATION OF THE SKIN—LIVER SPOT.

| | | |
|---|---|---|
| Take of Phosphate of sodium | 1 drachm. | 4. |

Divide into twelve powders or capsules.

Dose: One every two or three hours.

### CHLOASMA—PIGMENTATION OF THE SKIN—LIVER SPOT.

| | | |
|---|---|---|
| Take of Solution of iodide of arsenic and mercury | 2 drachms. | 8. |
| Fluidextract of nux vomica | 2 drachms. | 8. |

Mix. Dose: Five to ten drops in water three times a day.

### COMEDO—SEBACEOUS PLUG OR GRUB.

| | | |
|---|---|---|
| Take of Dialyzed iron | 1 ounce. | 32. |
| Glycerin | 2 ounces. | 64. |
| Castor oil | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls night and morning.

### COMEDO—SEBACEOUS PLUG OR GRUB.

| | | |
|---|---|---|
| Take of Codliver oil | ½ ounce. | 16. |
| Sulphuric ether | 20 minims. | 1.30 |

Mix. One dose: To be taken three times a day.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | |
|---|---|---|
| Take of Croton chloral hydrate | 36 grains. | 2.16 |
| Glycerite of tragacanth, a sufficient quantity. | | |

Mix and divide into twelve capsules.
Dose: One pill every two or three hours.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | |
|---|---|---|
| Take of Fluid extract of gelsemium | 2 drachms. | 8. |

Dose: Two to five drops in water every three or four hours.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | |
|---|---|---|
| Take of Extract of Indian hemp | 4 grains. | 0.24 |
| Phenyl salicylate | 48 grains. | 3. |

Mix and divide into sixteen pills.
Dose: One pill three to four times a day.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | |
|---|---|---|
| Take of Urethan (ethyl carbamate) | 1 drachm. | 4. |
| Elixir of orange | 4 ounces. | 128. |

Mix. Dose: From one to three teaspoonfuls every two or three hours.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | |
|---|---|---|
| Take of Extract of belladonna leaves | 3 grains. | 0.18 |
| Sulphate of quinine | 18 grains. | 1.08 |
| Sulphate of strychnine | ⅕ grain. | 0.012 |
| Arsenic trioxide | ¼ grain. | 0.015 |

Mix and divide into twelve pills.
Dose: A pill two or three times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Lime-water | 4 ounces. | 128. |
| Glycerin | 4 ounces. | 128. |
| Syrup of senna | 4 ounces. | 128. |

Mix. Dose: One tablespoonful three to four times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Tincture of strophanthus | 2 drachms. | 8. |

Dose: Five to ten drops in water three to four times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Tincture of aconite | 2 drachms. | 8. |
| Water | 6 drachms. | 24. |

Mix. Dose: Four to eight drops every hour or two.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Tartar emetic | ½ grain. | 0.03 |
| Solution of acetate of ammonium | 6 ounces. | 192. |

Mix. Dose: One tablespoonful in water every hour or two.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Subnitrate of bismuth | 2 drachms. | 8. |
| Fluid extract of gelsemium | 50 minims. | 3.25 |
| Powdered nutmeg | 40 grains. | 2.60 |
| Syrup of ginger | 3 ounces. | 96. |

Mix. Dose: One or two teaspoonfuls in water every hour or two.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Oil of gaultheria | ½ ounce. | 16. |
| Carbonate of magnesium | 8 drachms. | 32. |
| Water | 10 ounces. | 320. |

Mix. Dose: Half to two drachms in water three times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Carbonate of magnesium | ½ ounce. | 16. |
| Aromatic spirit of ammonia | 1 drachm. | 4. |
| Tincture of rhubarb | ½ ounce. | 16. |
| Peppermint-water | 4 ounces. | 128. |
| Syrup of lemon | 2 ounces. | 96. |

Mix. Dose: One tablespoonful three or four times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 2 drachms. | 8. |

Make into twelve capsules.
Dose: One capsule three to four times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Wine of antimony | 1 drachm. | 4. |
| Glycerin | 3 ounces. | 96. |

Mix. Dose: One to two teaspoonfuls every three hours.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Antipyrin | 50 grains. | 3. |

Make into ten capsules.
Dose: One capsule three to four times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Lupulin | 20 grains. | 1.30 |
| Extract of belladonna leaves | 3 grains. | 0.18 |
| Sulphate of quinine | 20 grains. | 1.30 |

Mix and divide into twenty pills.
Dose: From four to five pills daily.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Calomel | 8 grains. | 0.50 |
| Powdered nutmeg | ½ drachm. | 2. |

Mix and divide into fifteen powders.
Dose: One powder three times a day.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Tincture of rhus toxicodendron (poison ivy) | 2 drachms. | 8. |

Dose: One to two drops in water every two or three hours.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Tincture of opium (deodorized) | 2 drachms. | 8. |
| Tincture of gelsemium | 1 drachm. | 4. |
| Bicarbonate of sodium | ½ ounce. | 16. |
| Camphor-water | 2 ounces. | 64. |
| Spirit of nitrous ether | 2½ ounces. | 80. |

Mix. Dose: One or two teaspoonfuls every three or four hours.

### ECZEMA, ACUTE.

| | | |
|---|---|---|
| Take of Sulphate of magnesium | ½ ounce. | 16. |
| Tincture of aconite | 12 minims. | 0.72 |
| Syrup of senna | 1 ounce. | 32. |
| Water | 3 ounces. | 96. |

Mix. Dose: One dessertspoonful every four hours.

### ECZEMA ANI—ECZEMA OF THE ANUS.

| | | |
|---|---|---|
| Take of Arsenic trioxide | 3 grains. | 0.18 |
| Extract of hyoscyamus | 4 grains. | 0.24 |
| Pill of carbonate of iron | 1 drachm. | 4. |

Mix and divide into twenty suppositories.

Dose: Insert one into the rectum four times a day.

### ECZEMA ANI—ECZEMA OF THE ANUS.

| | | |
|---|---|---|
| Take of Fluidextract of witch-hazel | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: From one-half to one teaspoonful night and morning. Rectal injections of the same combination can be made with advantage once or twice a day.

### ECZEMA ANI—ECZEMA OF THE ANUS.

| | | |
|---|---|---|
| Take of Mercury with chalk | 12 grains. | 0.72 |

Divide into four powders.

Dose: Take in divided doses during twenty-four hours and follow with a saline.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Arsenic trioxide | 1 grain. | 0.06 |
| Extract of belladonna leaves | 5 grains. | 0.30 |
| Extract of calamus | 2 scruples. | 2.60 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Ichthyol (sulpho-ichthyolate of sodium) | 2 drachms. | 8. |

Dose: Five to twenty drops in water two or three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Ichthyol (sulpho-ichthyolate of sodium) | 1 scruple. | 1.30 |

Divide into forty pills.

Dose: One to ten pills a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Phosphide of zinc | 1 grain. | 0.06 |
| Extract of Indian hemp | 3 grains. | 0.18 |
| Sulphate of quinine | 1 drachm. | 4. |

Mix and divide into thirty pills.

Dose: One pill after each meal.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Venice turpentine | 5 grains. | 0.30 |
| Extract of belladonna leaves | 5 grains. | 0.30 |
| Extract of gentian | 2 scruples. | 2.60 |

Mix and divide into twenty pills.

Dose: Four to six pills a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Tartar emetic | 2 grains. | 0.12 |
| Sulphate of quinine | 2 scruples. | 2.60 |

Mix and divide into twenty pills.
Dose: One pill four times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Sulphide of arsenic | 1 grain. | 0.06 |
| Betanaphthol | 24 grains. | 1.50 |

Mix and divide into twelve pills.
Dose: One pill three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Iodide of iron | 40 grains. | 2.60 |
| Arsenate of sodium | 1 grain. | 0.06 |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Codliver oil | 10 ounces. | 320. |
| Oil of gaultheria | 10 minims. | 0.60 |

Mix and make into an emulsion *sec. art.*
Dose: One tablespoonful three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Iodide of potassium | 200 grains. | 12. |
| Aloin | 2 grains. | 0.12 |
| Syrup of sarsaparilla | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Aloin | 2 grains. | 0.12 |
| Sublimed sulphur | 100 grains. | 6. |
| Tincture of belladonna leaves | 60 minims. | 4. |

Mix and divide into twenty capsules.
Dose: A capsule three times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Solution of arsenate of sodium | 1 drachm. | 4. |
| Tincture of nux vomica | 1 drachm. | 4. |
| Ferrated elixir of gentian | 5 ounces. | 160. |

Mix. Dose: A teaspoonful in water after meals.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Sulphide of arsenic | 2 grains. | 0.12 |
| Aloin | 2 grains. | 0.12 |
| Extract of belladonna leaves | 2 grains. | 0.12 |
| Extract of dandelion | 40 grains. | 2.60 |

Mix and divide into twenty pills.
Dose: One pill three or four times a day.

### ECZEMA, CHRONIC.

| | | |
|---|---|---|
| Take of Salol (phenyl salicylate) | 100 grains. | 6. |
| Podophyllotoxin | 2 grains. | 0.12 |

Mix and divide into twenty capsules.
Dose: One to two capsules three times a day.

### ECZEMA CRURUM—ECZEMA OF THE LEGS.

| | | |
|---|---|---|
| Take of Fluidextract of witch-hazel | 3 ounces. | 96. |

Dose: From ten drops to a teaspoonful in water three times a day.

### ECZEMA GENITALIUM—ECZEMA OF THE GENITAL ORGANS.

| | | |
|---|---|---|
| Take of Tincture of nux vomica | ½ ounce. | 16. |

Dose: Three, gradually increasing, to thirty, drops in water, three or four times a day.

### ECZEMA GENITALICUM—ECZEMA OF THE GENITAL ORGANS, ACUTE.

| | | |
|---|---|---|
| Take of Antimonial wine | 2 drachms. | 8. |
| Spirit of nitrous ether | 3 ounces. | 96. |
| Solution of actate of ammonium | 3 ounces. | 96. |

Mix. Dose: Two teaspoonfuls in water every three hours.

### ECZEMA GENITALIUM—ECZEMA OF THE GENITAL ORGANS, CHRONIC.

| | | |
|---|---|---|
| Take of Copaiba | 40 grains. | 2.60 |
| Venice turpentine | 5 grains. | 0.30 |
| Extract of belladonna leaves | 3 grains. | 0.18 |

Mix and divide into twenty pills.

Dose: One pill three to four times a day.

### ECZEMA GENITALIUM—ECZEMA OF THE GENITAL ORGANS, CHRONIC.

| | | |
|---|---|---|
| Take of Chaulmoogra oil | 1 ounce. | 32. |

Dose: Ten to thirty drops in milk three to four times a day.

### ECZEMA, INFANTILE.

| | | |
|---|---|---|
| Take of Syrup of iodide of iron | 1 ounce. | 32. |
| Fluidextract of malt | 5 ounces. | 160. |

Mix. Dose: Half to two teaspoonfuls three times a day.

### ECZEMA, INFANTILE.

| | | |
|---|---|---|
| Take of Calomel | 2 grains. | 0.15 |
| Sugar | 1 scruple. | 2.60 |

Triturate and divide into five powders.

Dose: One powder every second or third day, followed by one-half teaspoonful of carbonate of magnesium or a teaspoonful of castor oil.

### ECZEMA, INFANTILE ACUTE.

| | | |
|---|---|---|
| Take of Antimonial wine | 24 minims. | 1.50 |
| Cinnamon-water | 3 ounces. | 96. |

Mix. Dose: One teaspoonful three to four times a day.

### ECZEMA, INFANTILE ACUTE.

| | | |
|---|---|---|
| Take of Pepsin | 36 grains. | 2.16 |
| Subnitrate of bismuth | 36 grains. | 2.16 |
| Powdered nutmeg | 4 grains. | 0.24 |

Mix and divide into twelve powders.

Dose: One powder after feeding three or four times a day.

### ECZEMA, INFANTILE CHRONIC.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 2 drachms. | 8. |
| Glycerin | 3 ounces. | 96. |

Mix. Dose: From one to two teaspoonfuls night and morning.

### ECZEMA, INFANTILE CHRONIC.

| | | |
|---|---|---|
| Take of Syrup of onion (from Spanish onion) | 4 ounces. | 128. |
| Compound syrup of phosphates | 1 ounce. | 32. |

Mix. Dose: One or two teaspoonfuls in water or milk three or four times a day.

### ECZEMA, INFANTILE CHRONIC.

| | | |
|---|---|---|
| Take of Syrup of lactate of iron | 3 ounces. | 96. |
| Chlorate of potassium | 1 drachm. | 4. |

Mix. Dose: One-half to one teaspoonful three times a day.

### ECZEMA MANUUM ET PEDUM—ECZEMA OF THE HANDS AND FEET.

| | | |
|---|---|---|
| Take of Protiodide of mercury | 5 grains. | 0.30 |
| Extract of nux vomica | 2 grains. | 0.12 |
| Extract of dandelion | 20 grains. | 1.30 |

Mix and divide into twenty pills.

Dose: One pill three to four times a day.

### ECZEMA SCROTI—ECZEMA OF THE SCROTUM.

| | | |
|---|---|---|
| Take of Tincture of nux vomica | 3 drachms. | 12. |

Dose: Two to twenty drops in water every three or four hours.

### ECZEMA SCROTI—ECZEMA OF THE SCROTUM.

| | | |
|---|---|---|
| Take of Sulphide of calcium | 10 grains. | 0.60 |
| Extract of belladonna leaves | 3 grains. | 0.18 |
| Arsenic trioxide | 1 grain. | 0.06 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### ECZEMA VULVÆ VEL VAGINÆ—ECZEMA OF THE VULVA OR VAGINA.

| | | |
|---|---|---|
| Take of Extract of belladonna leaves | 5 grains. | 0.30 |
| Arsenic trioxide | 3 grains. | 0.18 |
| Extract of opium | 2 grains. | 0.12 |
| Sulphate of quinine | 1 scruple. | 1.30 |
| Oil of theobroma | sufficient. | |

Mix and divide into twenty suppositories.

Dose: Insert one in the vagina four times a day.

### ECZEMA VULVÆ VEL VAGINÆ—ECZEMA OF THE VULVA OR VAGINA.

| | | |
|---|---|---|
| Take of Lupulin | 50 grains. | 3. |
| Camphor | 2 scruples. | 2.60 |

Mix and divide into ten suppositories.

Dose: Insert one in the vagina when necessary to quiet the system and relieve the itching.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Extract of cannabis indica | 5 grains. | 0.30 |
| Extract of nux vomica | 5 grains. | 0.30 |
| Sulphide of arsenic | 2 grains. | 0.12 |
| Sulphate of morphine | 2 grains. | 0.12 |

Mix and divide into twenty pills.

Dose: One pill three to four times a day.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Hydrochloride of cocaine | 5 grains. | 0.30 |
| Sulphate of atropine | ¼ grain. | 0.015 |
| Extract of gentian | 40 grains. | 2.60 |

Mix and divide into forty pills.
Dose: One pill three to four times a day.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Powdered bloodroot | 10 grains. | 0.60 |
| Extract of conium | 10 grains. | 0.60 |
| Extract of hyoscyamus | 4 grains. | 0.24 |

Mix and divide into thirty pills.
Dose: One pill three times a day.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Arsenic trioxide | 1 grain. | 0.06 |
| Extract of belladonna leaves | 5 grains. | 0.30 |
| Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Arsenate of sodium | 1 grain. | 0.06 |
| Iodide of iron | 40 grains. | 2.60 |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Sulphate of morphine | ½ grain. | 0.03 |
| Bromide of sodium | 3 drachms. | 12. |
| Syrup of lactucarium | 5 ounces. | 160. |

Mix. Dose: One tablespoonful every two or three hours until relieved of pain.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Hydrochloride of cocaine | 4 grains. | 0.24 |
| Citrate of caffeine | 1 drachm. | 4. |
| Simple syrup | 4 ounces. | 128. |

Mix. Dose: One teaspoonful in water every two or three hours, until relieved of pain.

### EPITHELIOMA—EPITHELIAL CANCER—SARCOMA—CARCINOMA.

| | | |
|---|---|---|
| Take of Bromhydride of cocaine | 4 grains. | 0.24 |
| Sulphate of morphine | 1 grain. | 0.06 |
| Orange-flower water | 1 ounce. | 32. |

Mix. Dose: Ten to fifteen drops, to relieve pain, every three to four hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Sulphate of quinine | 1 drachm. | 4. |
| Extract of belladonna leaves | 3 grains. | 0.18 |
| Oil of theobroma, sufficient quantity. | | |

Mix and divide into twelve suppositories.
Dose: Insert one in the bowel every two or three hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Tincture of chloride of iron | 3 ounces. | 96. |
| Sulphate of quinine | 2½ drachms. | 10. |

Mix. Dose: From one-half to one teaspoonful in a wineglassful of water every three hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Tincture of belladonna leaves | 1 drachm. | 4. |
| Tincture of aconite root | 1 drachm. | 4. |

Mix. Dose: From four to five drops in water every two or three hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Salol (phenyl salicylate) | 1 drachm. | 4. |
| Sulphate of quinine | 24 grains. | 1.50 |

Mix and divide into twelve capsules.

Dose: One capsule every two or three hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Extract of belladonna leaves | 2 grains. | 0.12 |
| Extract of stramonium | 2 grains. | 0.12 |
| Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: One pill every two or three hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Antipyrin | 1 drachm. | 4. |
| Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twelve powders.

Dose: One powder three to four times a day.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Tartar emetic | 1 grain. | 0.06 |
| Camphor-water | 3 ounces. | 96. |
| Spirit of nitrous ether | 3 ounces. | 96. |

Mix. Dose: One tablespoonful in water every one or two hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Hydrochloride of pilocarpine | 1 grain. | 0.06 |
| Tincture of aconite | 24 minims. | 1.50 |
| Water | 3 ounces. | 96. |

Mix. Dose: One teaspoonful every three or four hours.

### ERYSIPELAS.

| | | |
|---|---|---|
| Take of Tincture of chloride of iron | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls in a wineglassful of water every two or three hours.

### ERYTHEMA.

| | | |
|---|---|---|
| Take of Subnitrate of bismuth | 1 drachm. | 4. |
| Creosote | 5 minims. | 0.30 |
| Syrup of acacia | 2 ounces. | 64. |
| Peppermint-water | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls three to four times a day.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Infusion of digitalis | 2 ounces. | 64. |
| | Spirit of nitrous ether | 2 ounces. | 64. |

Mix. Dose: From one to two teaspoonfuls in water every three hours.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Phosphate of soda | 2 drachms. | 8. |
| | Diastasic extract of malt | 3 ounces. | 96. |

Mix. Dose: One to two teaspoonfuls in milk three to four times a day.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Tincture of gelsemium | 1 drachm. | 4. |
| | Tincture of belladonna leaves | ½ drachm. | 2. |

Mix. Dose: (Adult) four drops in water every three hours.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Sulphate of iron | 24 grains. | 1.50 |
| | Sulphate of magnesium | 5 drachms. | 20. |
| | Dilute sulphuric acid | ½ drachm. | 2. |
| | Syrup of senna | 2 ounces. | 64. |
| | Water | 6 ounces. | 192. |

Mix. Dose: One tablespoonful in water night and morning.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Infusion of quassia | 4 ounces. | 128. |
| | Solution of citrate of potassium | 2 ounces. | 64. |

Mix. Dose: One to two tablespoonfuls three or four times a day.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Chlorate of potassium | 5 drachms. | 20. |
| | Syrup of lactate of iron | 4 ounces. | 128. |

Mix. Dose: Two teaspoonfuls in water three or four times a day.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Sulphide of calcium | 5 grains. | 0.30 |
| | Extract of belladonna leaves | 2 grains. | 0.12 |
| | Extract of gentian | 35 grains. | 2.10 |

Mix and divide into twenty pills.
Dose: One pill every two or three hours.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Citrate of iron and quinine | 2 drachms. | 8. |
| | Dilute sulphuric acid | 1 drachm. | 4. |
| | Sherry wine | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls three or four times a day.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Oxide of silver | 4 grains. | 0.24 |
| | Extract of belladonna leaves | 2 grains. | 0.12 |
| | Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### FURUNCULUS—BOIL.

| | | |
|---|---|---|
| Take of Compound syrup of phosphates (N. F.) | 5 ounces. | 160. |
| Aloin | 2 grains. | 0.12 |

Mix. Dose: Two teaspoonfuls three times a day.

### FURUNCULUS—BOIL.

| | | |
|---|---|---|
| Take of Oleoresin of capsicum | 3 grains. | 0.18 |
| Extract of nux vomica | 2 grains. | 0.12 |
| Pyrophosphate of iron | 1 drachm. | 4. |

Mix and divide into thirty pills.
Dose: One pill three or four times a day.

### FURUNCULUS—BOIL.

| | | |
|---|---|---|
| Take of Fluidextract of witch-hazel | ½ ounce. | 16. |
| Diastasic extract of malt | 4 ounces. | 128. |

Mix. Dose: From one-half to one tablespoonful in water three or four times a day.

### FURUNCULUS—BOIL.

| | | |
|---|---|---|
| Take of Tincture of prickly-ash bark | 6 ounces. | 192. |
| Tincture of nux vomica | ½ drachm. | 2. |
| Tincture of capsicum | 1 drachm. | 4. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### FURUNCULUS—BOIL.

| | | |
|---|---|---|
| Take of Sulphate of cinchonidine | 16 grains. | 1. |
| Extract of prickly-ash bark | 16 grains. | 1. |
| Extract of burdock-root | 16 grains. | 1. |

Mix and divide into sixteen pills.
Dose: Two pills three times daily.

### HERPES.

| | | |
|---|---|---|
| Take of Ferrocyanide of iron | 16 grains. | 1. |
| Extract of coca | 16 grains. | 1. |
| Extract of nux vomica | 2 grains. | 0.12 |

Mix and divide into sixteen pills.
Dose: One pill three times a day.

### HERPES.

| | | |
|---|---|---|
| Take of Fluidextract of golden seal | 1 ounce. | 32. |
| Wine of coca | 3 ounces. | 96. |

Mix. Dose: From one to two teaspoonfuls in water three to four times a day.

### HERPES.

| | | |
|---|---|---|
| Take of Arsenate of iron | 1 grain. | 0.06 |
| Extract of cinchona | 1 drachm. | 4. |

Mix and divide into thirty pills.
Dose: Three or four pills a day.

### HERPES.

| | | |
|---|---|---|
| Take of Pure pepsin | 1 drachm. | 4. |
| Subnitrate of bismuth | 1 drachm. | 4. |
| Oil of cinnamon | 5 minims. | 0.30 |

Mix and divide into twelve powders.
Dose: One powder after each meal.

### HERPES.

| | | |
|---|---|---|
| Take of Aloin | 2 grains. | 0.12 |
| Extract of belladonna leaves | 2 grains. | 0.12 |
| Extract of nux vomica | 2 grains. | 0.12 |
| Powdered poke-root | 20 grains. | 1.30 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### HERPES.

| | | |
|---|---|---|
| Take of Phosphide of zinc | ½ grain. | 0.03 |
| Sulphate of quinine | 2 scruples. | 2.60 |

Mix and divide into forty pills.

Dose: One pill three or four times a day.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Bromide of sodium | 200 grains. | 12. |
| Hydrate of chloral | 100 grains. | 6. |
| Syrup of tolu | 5 ounces. | 160. |

Mix. Dose: One tablespoonful in water every hour until relieved.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Tincture of aconite | 24 minims. | 1.50 |
| Deodorized tincture of opium | 1¼ drachm. | 5. |
| Solution of citrate of potassium | 2 ounces. | 64. |
| Syrup of orange-flower water | 1 ounce. | 32. |

Mix. Dose: One teaspoonful every one or two hours.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Sulphate of atropine | 1/80 grain. | 0.0008 |
| Sulphate of morphine | ¼ grain. | 0.015 |

Mix. Dose: Inject hypodermically at once, for the relief of pain, into the subcutaneous cellular or muscular tissue.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Powder of ipecacuanha and opium | 24 grains. | 1.5 |
| Sulphate of quinine | 24 grains. | 1.5 |

Mix and divide into twelve capsules.

Dose: One capsule every two or three hours until relieved of pain.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Syrup of lactucarium | 2 ounces. | 64. |
| Syrup of lupulin | 2 ounces. | 64. |
| Sulphate of morphine | 1 grain. | 0.06 |
| Fluidextract of cannabis indica | 1 drachm. | 4. |

Mix. Dose: Two teaspoonfuls in water every hour or two until relieved of pain.

### HYPERIDROSIS—EXCESSIVE PERSPIRATION.

| | | |
|---|---|---|
| Take of Hydrochloride of hydrastine | 1 grain. | 0.06 |
| Protocarbonate of iron | 40 grains. | 2.60 |
| Arsenic trioxide | 1 grain. | 0.06 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### HYPERIDROSIS—EXCESSIVE PERSPIRATION.

| | | |
|---|---|---|
| Take of Agaricin | 1 grain. | 0.06 |
| Sulphate of cinchonidine | 50 grains. | 3. |

Mix and divide into twenty-four pills.

Dose: One pill three to four times a day.

### HYPERIDROSIS—EXCESSIVE PERSPIRATION.

| | | |
|---|---|---|
| Take of Aromatic sulphuric acid | 4 drachms. | 16. |
| Tincture of nux vomica | 1 drachm. | 4. |
| Compound syrup of sarsaparilla | 6 ounces. | 192. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### HYPERIDROSIS—EXCESSIVE PERSPIRATION.

| | | |
|---|---|---|
| Take of Oxide of zinc | 4 grains. | 0.24 |
| Extract of calamus | 24 grains. | 1.50 |

Mix and divide into sixteen pills.

Dose: One pill three or four times a day.

### HYPERIDROSIS—EXCESSIVE PERSPIRATION.

| | | |
|---|---|---|
| Take of Tincture of belladonna leaves | 50 minims. | 3. |
| Fluidextract of triticum | 3 ounces. | 96. |

Mix. Dose: One teaspoonful three times a day.

### HYPERIDROSIS—EXCESSIVE PERSPIRATION.

| | | |
|---|---|---|
| Take of Ergotin | 10 grains. | 0.60 |
| Dried sulphate of iron | 20 grains. | 1.30 |

Mix and divide into twenty pills.

Dose: Two to four pills a day.

### ICHTHYOSIS.

| | | |
|---|---|---|
| Take of Fluidextract of pilocarpus (jaborandi) | 2 drachms. | 8. |
| Spirit of nitrous ether | 2 ounces. | 64. |
| Solution of acetate of ammonium | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls in water night and morning.

### ICHTHYOSIS.

| | | |
|---|---|---|
| Take of Codliver oil | 4 ounces. | 128. |
| Lime-water | 4 ounces. | 128. |
| Aromatic syrup | 4 ounces. | 128. |

Mix and make into an emulsion.

Dose: From one-half to one tablespoonful three times a day.

### LEPROSY.

| | | |
|---|---|---|
| Take of Tincture of nux vomica | 4 drachms. | 16. |
| Solution of arsenite of potassium | 2 drachms. | 8. |

Mix. Dose: Fifteen to thirty drops in water three times a day.

### LEPROSY.

| | | |
|---|---|---|
| Take of Guaiacol | 3 drachms. | 12. |
| Port or sherry wine | 1 pint. | 512. |

Mix. Dose: One tablespoonful three times a day.

### LEPROSY.

| | | |
|---|---|---|
| Take of Oil of chaulmoogra (gynocardia) | 1 ounce. | 32. |

Dose: Ten to thirty drops three times a day. Also used by inunction once daily

### LEPROSY.

| | | | |
|---|---|---|---|
| Take of | Nitrate of silver | 3 grains. | 0.18 |
| | Syrup of gum arabic | 3 ounces. | 93. |

Mix. Dose: One teaspoonful in a wineglassful of water three times a day.

### LEPROSY.

| | | | |
|---|---|---|---|
| Take of | Iodide of potassium | 3 drachms. | 12. |
| | Glycerin | 2 ounces. | 64. |
| | Water | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls four times a day.

### LUPUS ERYTHEMATOSUS.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | 1 drachm. | 4. |
| | Cream of tatar | 12 grains. | 0.72 |
| | Aloin | 1 grain. | 0.06 |

Mix and divide into twelve capsules.
Dose: One capsule three or four times a day.

### LUPUS ERYTHEMATOSUS.

| | | | |
|---|---|---|---|
| Take of | Codliver oil | 4 ounces. | 128. |
| | Syrup of lactophosphate of lime | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls three times a day.

### LUPUS ERYTHEMATOSUS.

| | | | |
|---|---|---|---|
| Take of | Chlorate of potassium | 2 drachms. | 8. |
| | Compound tincture of cinchona | 6 ounces. | 192. |

Mix. Dose: One dessertspoonful in water three or four times a day.

### LUPUS VULGARIS.

| | | | |
|---|---|---|---|
| Take of | Sulphate of quinine | 20 grains. | 1.30 |
| | Carbonate of iron | 20 grains. | 1.30 |
| | Calomel | 2 grains. | 0.12 |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### LUPUS VULGARIS.

| | | | |
|---|---|---|---|
| Take of | Iodide of iron | 40 grains. | 2.60 |
| | Trioxide of arsenic | 1 grain. | 0.06 |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### LUPUS VULGARIS.

| | | | |
|---|---|---|---|
| Take of | Cresosote | 4 minims. | 0.24 |
| | Glycerite of pepsin | 3 ounces. | 96. |
| | Mint-water | 2 ounces. | 62. |

Mix. Dose: A teaspoonful three times a day.

### LUPUS VULGARIS.

| | | | |
|---|---|---|---|
| Take of | Iodide of arsenic | 1 grain. | 0.06 |
| | Carbonate of iron | 24 grains. | 1.50 |
| | Extract of belladonna leaves | 1 grain. | 0.06 |

Mix and divide into twelve pills.
Dose: One pill three times a day.

### LUPUS VULGARIS.

| | | |
|---|---|---|
| Take of Iodide of potassium | 3 drachms. | 12. |
| Compound syrup of phosphates | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### LUPUS VULGARIS.

| | | |
|---|---|---|
| Take of Corrosive chloride of mercury | 2 grains. | 0.12 |
| Tincture of gold-thread (coptis) | 5 ounces. | 160. |

Mix. Dose: One to two teaspoonfuls in water three times a day.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Codliver oil | 3 ounces. | 96. |

Dose: Inject hypodermically from one to two teaspoonfuls into the subcutaneous cellular, or muscular, tissue of the back, every day or two.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Solution of arsenate of sodium | 2 drachms. | 8. |

Dose: Inject hypodermically from five to twenty minims into the skin or muscular tissue every day or two.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Pure phenol, or carbolic acid | 4 grains. | 0.24 |
| Distilled water | ½ ounce. | 16. |

Mix. Dose: Inject hypodermically from fifteen to thirty minims (gr. ¼ to ½) when necessary.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Phosphide of zinc | 1 grain. | 0.06 |
| Extract of nux vomica | 2½ grains. | 0.15 |
| Extract of ergot | 20 grains. | 1.33 |

Mix and make into ten pills.

Dose: One pill every three or four hours.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Acetanilid | 100 grains. | 6. |
| Lupuline | 100 grains. | 6. |

Mix and divide into twenty powders or capsules.

Dose: One every two or three hours.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Bromide of sodium | 8 drachms. | 32. |
| Tincture of gelsemium | ½ drachm. | 2. |
| Syrup of orange-flowers | 4 ounces. | 128. |

Mix. Dose: Two teaspoonfuls in water every two or three hours.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Tincture of belladonna leaves | 3 drachms. | 12. |

Dose: Five to fifteen drops in water every three or four hours.

### PARESTHESIA OR PRURITUS—ITCHING OF THE SKIN.

| | | |
|---|---|---|
| Take of Hydrate of chloral | 2 drachms. | 8. |
| Syrup of wild cherry (prunus virginiana) | 1 ounce. | 32. |
| Syrup of tolu | 2 ounces. | 64. |

Mix. Dose: One or two teaspoonfuls in water every two or three hours.

### PEMPHIGUS.

| | | |
|---|---|---|
| Take of Nitrate of silver | 2 grains. | 0.12 |
| Powdered opium | 4 grains. | 0.24 |
| Extract of belladonna leaves | 2 grains. | 0.12 |

Mix and divide into sixteen pills.

Dose: One pill every four hours.

### PEMPHIGUS.

| | | |
|---|---|---|
| Take of Arsenic trioxide | 1 grain. | 0.06 |
| Black pepper | 10 grains. | 0.60 |
| Sulphate of quinine | 10 grains. | 0.60 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### PEMPHIGUS.

| | | |
|---|---|---|
| Take of Iodide of potassium | 3 drachms. | 12. |
| Compound tincture of cardamon | 2 ounces. | 64. |
| Compound tincture of gentian | 2 ounces. | 64. |

Mix. Dose: One teaspoonful every three or four hours.

### PEMPHIGUS.

| | | |
|---|---|---|
| Take of Arsenate of sodium | 1 grain. | 0.06 |
| Pyrophosphate of iron | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### PEMPHIGUS.

| | | |
|---|---|---|
| Take of Sulphate of quinine | 1 drachm. | 4. |
| Extract of opium | 6 grains. | 0.36 |
| Extract of belladonna leaves | 4 grains. | 0.24 |

Mix and make into twelve suppositories.

Dose: Insert one into the bowel three or four times a day when the eruption is attended with much suffering.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Solution of arsenite of potassium | 1 drachm. | 4. |
| Tincture of nux vomica | 2 drachms. | 8. |

Mix. Dose: From fifteen to twenty drops in water three times a day.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 100 grains. | 6. |
| Trioxide of arsenic | 1 grain. | 0.06 |

Mix and divide into twenty capsules.

Dose: A capsule after meals.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Fluidextract of dandelion (taraxacum) | 2 ounces. | 64. |
| Spirit of nitrous ether | 3 ounces. | 96. |
| Aloin | 2 grains. | 0.12 |

Mix. Dose: Two teaspoonfuls in water four times a day.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Infusion of digitalis | 2 ounces. | 64. |
| Solution of acetate of ammonium | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls in water every two or three hours.

### PSORIASIS.

| | | | |
|---|---|---|---|
| Take of | Actate of potassium | 2 drachms. | 8. |
| | Infusion of digitalis | 4 ounces. | 128. |
| | Infusion of pilocarpus | 6 ounces. | 192. |
| | Fluidextract of cascara (rhamnus purshiana) | 2 drachms. | 8. |

Mix. Dose: One tablespoonful every three hours.

### PSORIASIS.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | 2 drachms. | 8. |
| | Bicarbonate of sodium | 40 grains. | 2.60 |
| | Compound tincture of cardamon | 1 ounce. | 32. |
| | Water | 2 ounces. | 64. |

Mix. Dose: One teaspoonful in water every three hours.

### PSORIASIS.

| | | | |
|---|---|---|---|
| Take of | Arsenate of sodium | 1 grain. | 0.06 |
| | Podophyllotoxin | 2 grains. | 0.12 |
| | Extract of calamus | 40 grains. | 2.60 |

Mix and divide into forty pills.
Dose: Two to four pills a day.

### PSORIASIS.

| | | | |
|---|---|---|---|
| Take of | Acetic extract of colchicum | 10 grains. | 0.60 |
| | Arsenic trioxide | 1 grain. | 0.06 |
| | Sulphate of quinine | 30 grains. | 2. |
| | Extract of leptandra | 10 grains. | 0.60 |

Mix and divide into thirty pills.
Dose: One pill three times a day.

### PURPURA.

| | | | |
|---|---|---|---|
| Take of | Sulphate of quinine | 40 grains. | 2.60 |
| | Venice turpentine | 5 grains. | 0.30 |

Mix and divide into twenty pills.
Dose: One pill four times a day.

### PURPURA.

| | | | |
|---|---|---|---|
| Take of | Chloride of calcium | 6 drachms. | 24. |
| | Syrup of orange | 5 ounces. | 160. |

Mix. Dose: A teaspoonful in water every hour, when there is hemorrhage.

### PURPURA.

| | | | |
|---|---|---|---|
| Take of | Dried sulphate of iron | 16 grains. | 1. |
| | Extract of Indian hemp | 8 grains. | 0.50 |

Mix and divide into sixteen pills.
Dose: Two to three pills a day.

### PURPURA.

| | | | |
|---|---|---|---|
| Take of | Tincture of chloride of iron | 2 ounces. | 64. |
| | Fluidextract of ergot | 2 ounces. | 64. |

Mix. Dose: Thirty drops to one teaspoonful in a wineglassful of water every three hours.

### PURPURA.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 5 drachms. | 20. |
| Tincture of belladonna leaves | 72 minims. | 4.32 |
| Syrup of wild cherry (prunus virginiana) | 3 ounces. | 96. |

Mix. Dose: One teaspoonful in water three or four times a day.

### PURPURA.

| | | |
|---|---|---|
| Take of Aromatic sulphuric acid | 2 drachms. | 8. |
| Fluidextract of witch-hazel | 2 ounces. | 64. |
| Fluidextract of ergot | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls in water every two or three hours.

### PURPURA.

| | | |
|---|---|---|
| Take of Fluidextract of ergot | 1 ounce. | 32. |
| Sulphurous acid | 1 ounce. | 32. |
| Syrup of orange | 1 ounce. | 32. |

Mix. Dose: Two teaspoonfuls in water three or four times a day.

### PURPURA.

| | | |
|---|---|---|
| Take of Fluidextract of geranium | 2 ounces. | 64. |
| Fluidextract of witch-hazel | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls in water three or four times a day.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Oxide of zinc | 3 grains. | 0.18 |
| Extract of belladonna leaves | 1 grain. | 0.06 |
| Lactate of iron | 24 grains. | 1.50 |

Mix and divide into twelve pills.
Dose: One pill three times a day.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Fluidextract of hydrastis | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 100 grains. | 6.50 |
| Diastasic extract of malt | 10 ounces. | 320. |

Mix. Dose: One tablespoonful three times a day.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Ergotin | 20 grains. | 1.30 |
| Extract of nux vomica | 2 grains. | 0.12 |

Mix and divide into twenty pills.
Dose: One pill every four hours.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Tannic acid | 12 grains. | 0.72 |
| Extract of dandelion (taraxacum) | 12 grains. | 0.72 |
| Mucilage | sufficient. | |

Mix and divide into twelve pills.
Dose: Two pills three or four times a day.

### ROSEACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Fluidextract of witch-hazel | 1 ounce. | 32. |

Dose: Five to ten drops in water every three or four hours.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Tincture of veratrum | 24 minims. | 1.50 |
| Camphor-water | 1 ounce. | 32. |
| Solution of acetate of ammonium | 2 ounces. | 64. |

Mix. Dose: One teaspoonful in water every three hours.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Dilute hydrochloric acid | 1 drachm. | 4. |
| Compound tincture of cardamom | 1 ounce. | 32. |
| Simple syrup | 4 ounces. | 128. |

Mix. Dose: One or two teaspoonfuls in water every three hours.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Syrup of tolu | 1 ounce. | 32. |
| Muriate of ammonium | 80 grains. | 5.20 |
| Syrup of ipecacuanha | ½ ounce. | 16. |
| Compound syrup of squill | 1 ounce. | 32. |
| Syrup of wild cherry | 1½ ounce. | 48. |

Mix. Dose: One to two teaspoonfuls every three or four hours.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Tartar emetic | ½ grain. | 0.03 |
| Chlorate of potassium | 1 drachm. | 4. |
| Sweet spirit of nitre | 5 ounces. | 160. |

Mix. Dose: One to two teaspoonfuls in water every two or three hours.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Chloride of ammonium | 2 drachms. | 8. |
| Syrup of lactucarium | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: One or two teaspoonfuls every two or three hours.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Salol (phenyl salicylate) | 1 drachm. | 4. |
| Subnitrate of bismuth | 1 drachm. | 4. |

Mix and divide into twelve powders or capsules.
Dose: One every three hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Fluidextract of pilocarpus | ½ ounce. | 16. |
| Mixture of citrate of potassium | 2 ounces. | 64. |
| Syrup of orange | 1½ ounce. | 48. |

Mix. Dose: One or two teaspoonfuls every three or four hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Cream of tartar | 2 drachms. | 8. |
| Sweet spirit of nitre | ½ ounce. | 16. |
| Infusion of digitalis | ½ ounce. | 16. |

Mix. Dose: One teaspoonful in water every three or four hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Infusion of digitalis | 2 ounces. | 64. |
| Mixture of citrate of potassium | 2 ounces. | 64. |

Mix. Dose: One teaspoonful every two or three hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Infusion of digitalis | 5 ounces. | 160. |

Dose: Half to one teaspoonful every three or four hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Tincture of aconite | 20 minims. | 1.30 |
| Neutral mixture | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls every two hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 1 drachm. | 4. |
| Tincture of belladonna leaves | 24 minims. | 1.50 |
| Syrup of lemon | 3 ounces. | 96. |

Mix. Dose: One teaspoonful every two or three hours.

### SCARLATINA—SCARLET FEVER.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 2 drachms. | 8. |
| Tincture of chloride of iron | 2 drachms. | 8. |
| Glycerin | 1 ounce. | 32. |
| Water | 4 ounces. | 128. |

Mix. Dose: One to two teaspoonfuls in water every two or three hours.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Codliver oil | 4 ounces. | 128. |
| Lime-water | 2 ounces. | 64. |
| Wine of iron | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls after meals. Shake well before taking.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Syrup of lactophosphate of lime | 2 ounces. | 64. |
| Codliver oil | 4 ounces. | 128. |
| Oil of cinnamon | 3 minims. | 0.18 |

Mix. Dose: Two teaspoonfuls after meals.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Diluted phosphoric acid | ½ ounce. | 16. |
| Glycerin | 3 ounces. | 96. |
| Syrup of orange-peel | 1 ounce. | 32. |

Mix. Dose: One teaspoonful in a wineglassful of water after meals.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Codliver oil | 5 ounces. | 160. |
| Cream | 5 ounces. | 160. |
| Oil of wintergreen | 10 minims. | 0.60 |

Mix and make into an emulsion. (Should be made fresh each day.)

Dose: From one teaspoonful to one tablespoonful after meals.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Fluidextract of coto-bark | 2 drachms. | 8. |
| Fluidextract of witch-hazel | ½ ounce. | 16. |
| Cinnamon water | 10 ounces. | 320. |

Mix. Dose: One dessertspoonful three times a day.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 2 drachms. | 8. |
| Glycerin | 1 ounce. | 32. |
| Water | 2 ounces. | 64. |

Mix. Dose: One teaspoonful three or four times a day.

### SCROFULODERMA.

| | | |
|---|---|---|
| Take of Diastasic extract of malt | 5 ounces. | 160. |
| Precipitated sulphur | 3 drachms. | 12. |

Mix. Dose: One to two teaspoonfuls after meals.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Solution of arsenite of potassium | 1 drachm. | 4. |
| Sulphate of strychnine | 1 grain. | 0.06 |
| Aloin | 2 grains. | 0.12 |
| Syrup of lactophosphate of lime and iron | 6 ounces. | 192. |

Mix. Dose: One teaspoonful in water three times a day.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Sublimed sulphur | ½ drachm. | 2. |
| Extract of dandelion (taraxacum) | ½ drachm. | 2. |

Mix and divide into thirty pills.

Dose: One pill three or four times a day.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Venice turpentine | 5 grains. | 0.30 |
| Pyrophosphate of iron | 35 grains. | 2.10 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Oxide of zinc | 2 grains. | 0.12 |
| Lactate of iron | 20 grains. | 1.30 |
| Aloin | 1 grain. | 0.06 |

Mix and divide into ten pills.

Dose: One pill three times a day.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Sulphide of arsenic | 1 grain. | 0.06 |
| Extract of belladonna leaves | 1 grain. | 0.06 |
| Citrate of iron | 24 grains. | 1.50 |

Mix and divide into twelve pills.

Dose: One pill three times a day.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | |
|---|---|---|
| Take of Tincture of prickly-ash bark | 4 ounces. | 128. |
| Tincture of nux vomica | 200 minims. | 12. |
| Tincture of cardamom | 1 ounce. | 32. |

Mix. Dose: Two teaspoonfuls in water three times a day.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | |
|---|---|---|
| Take of Tincture of collinsonia | 1 ounce. | 32. |
| Glycerin | 4 ounces. | 128. |

Mix. Dose: One to two teaspoonfuls three times a day.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | |
|---|---|---|
| Take of Arsenate of iron | 1 grain. | 0.06 |
| Sulphate of quinine | 32 grains. | 2. |

Mix and divide into sixteen pills.

Dose: One pill three times a day.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | |
|---|---|---|
| Take of Syrup of hydriodic acid | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: One small half-teaspoonful in water three times a day.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | |
|---|---|---|
| Take of Syrup of iodide of iron | 2 ounces. | 64. |
| Glycerin | 2 ounces. | 64. |

Mix. Dose: Half to one teaspoonful in water three or four times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

| | | |
|---|---|---|
| Take of Hypophosphite of lime | 20 grains. | 1.30 |
| Arsenate of iron | 1 grain. | 0.06 |
| Extract of cascara sagrada (rhamnus purshiana) | 20 grains. | 1.30 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

| | | |
|---|---|---|
| Take of Iodoform | 3 grains. | 0.18 |
| Sulphate of quinine | 24 grains. | 1.50 |

Mix and divide into twelve pills.

Dose: One pill three or four times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

| | | |
|---|---|---|
| Take of Iodide of iron | 2 scruples. | 2.60 |
| Aloin | 2 grains. | 0.12 |
| Extract of belladonna leaves | 3 grains. | 0.18 |

Mix and divide into twenty pills.

Dose: One pill three or four times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

| | | |
|---|---|---|
| Take of Tartrate of antimony and potassium | 2 grains. | 0.12 |
| Extract of cinchona | 2 scruples. | 2.60 |

Mix and divide into twenty pills.

Dose: One pill three or four times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

| | | |
|---|---|---|
| Take of Corrosive sublimate | 2 grains. | 0.12 |
| Tincture of prickly ash (xanthoxylum) | 6 ounces. | 192. |

Mix. Dose: Two teaspoonfuls in water three or four times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD.

| | | |
|---|---|---|
| Take of Syrup of the hypophosphites | 3 ounces. | 96. |
| Extract of malt | 3 ounces. | 96. |
| Chlorate of potassium | 2 drachms. | 8. |

Mix. Dose: One dessertspoonful in water three times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD, CHRONIC.

| | | |
|---|---|---|
| Take of Sulphide of calcium | 10 grains. | 0.60 |
| Sulphate of quinine | 2 scruples. | 2.60 |

Mix and divide into twenty pills.
Dose: One pill four times a day.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES OF THE BEARD, CHRONIC.

| | | |
|---|---|---|
| Take of Arsenic trioxide | 1 grain. | 0.06 |
| Pyrophosphate of iron | 1 drachm. | 4. |
| Podophyllotoxin | 5 grains. | 0.30 |

Mix and divide into thirty pills.
Dose: One pill three times a day.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Corrosive sublimate | 1 grain. | 0.06 |
| Glycerin | 2 ounces. | 64. |
| Water | 2 ounces. | 64. |

Mix. Dose: Two teaspoonfuls four times a day.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Tannate of mercury | 5 grains. | 0.30 |
| Gum tragacanth | sufficient. | |
| Glycerin | sufficient. | |

Mix and divide into ten pills.
Dose: One pill a day, and gradually increase to three.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Chloride of gold and sodium | 1 grain. | 0.06 |
| Extract of gentian | 15 grains. | 1. |
| Powdered licorice-root | sufficient. | |

Mix and divide into twenty pills.
Dose: One pill three times a day.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Iodide of arsenic | ½ grain. | 0.03 |
| Extract of calamus | 30 grains. | 2. |

Mix and divide into fifteen pills.
Dose: One pill three times a day.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Iodide of lithium | 1 drachm. | 4. |
| Compound syrup of sarsaparilla | 5 ounces. | 160. |

Mix. Dose: A half to a tablespoonful three or four times a day.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Tincture of burdock-seed (lappa fructus) | 2 ounces. | 64. |
| | Tincture of poke-root (phytolacca) | 2 ounces. | 64. |
| | Tincture of prickly-ash bark (xanthoxylum) | 2 ounces. | 64. |
| | Tincture of yaw or queen's root (stillingia) | 2 ounces. | 64. |

Dose: Half to one teaspoonful in water before meals.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Powdered bloodroot (sanguinaria) | 2 grains. | 0.12 |
| | Iodide of iron | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: One pill four times a day.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Guaiac | 40 grains. | 2.60 |
| | Protiodide of mercury | 3 grains. | 0.18 |

Mix and divide into twelve pills.

Dose: One pill four times a day.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Calomel | 2 grains. | 0.12 |
| | Sugar | 2 scruples. | 2.60 |

Mix and divide into ten powders.

Dose: Three to five powders a day (for adults only).

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Creosote | 10 minims. | 0.60 |
| | Iodide of ethyl | 1 ounce. | 32. |

Mix. Dose: For *inhalation*, add a few drops on the handkerchief and inhale five or six times a day.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Iodide of potassium | 1½ drachm. | 6. |
| | Fluidextract of cimicifuga | 1½ drachm. | 6. |
| | Fluidextract of manaca | 1½ drachm. | 6. |
| | Compound syrup of sarsaparilla | 4 ounces. | 128. |

Mix. Dose: One tablespoonful in water four times a day.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Codliver oil | 4 ounces. | 128. |
| | Brandy | 4 ounces. | 128. |
| | Compound syrup of hypophosphites with iron | 4 ounces. | 128. |
| | Oil of peppermint | 10 minims. | 0.60 |

Mix and make into an emulsion.

Dose: A tablespoonful three times a day.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Corrosive chloride of mercury | 5 grains. | 0.30 |
| | Chloride of sodium | 10 grains. | 0.60 |
| | Distilled water | 1 ounce. | 32. |

Mix. Dose: (♏ 10 to 20 = gr. $\frac{1}{10}$ to $\frac{1}{5}$). Inject ten to twenty minims hypodermically every two or three days. If this causes pain, use a $\frac{1}{1000}$ solution, in equivalent dose.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Benzoate of mercury | 4 grains. | 0.24 |
| Chloride of sodium | ½ grain. | 0.03 |
| Distilled water | 1½ ounce. | 48. |

Mix. Dose: (♏ 15 = gr. 1/12). Inject hypodermically fifteen minims into the subcutaneous cellular or muscular tissue every two or three days.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Iodoform | 1 drachm. | 4. |
| Sulphuric ether | ½ ounce. | 16. |
| Oil of turpentine | ½ ounce. | 16. |

Mix. Dose: From three to ten drops by inhalation four or five times a day.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Arsenic trioxide | ½ grain. | 0.03 |
| Sulphate of iron | 40 grains. | 2.60 |

Mix and divide into twenty pills.
Dose: Two to four pills a day.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Iodide of potassium | 200 grains. | 12. |
| Tincture of stillingia | 2 ounces. | 64. |
| Compound syrup of sarsaparilla | 3 ounces. | 96. |

Mix. Dose: One to two teaspoonfuls four times a day.

### SYPHILIS.

#### *Gray Oil for Hypodermic Use.*

It is most important that gray oil should be sterile. The ingredients must be sterilized before they are incorporated, as it is impossible to sterilize the product. If the directions given below are carefully followed no risk of septic poisoning is to be apprehended. The formula proposed by M. Dumesnil has been accepted by a committee, specially appointed by the Société de Pharmacie of Paris, to investigate the methods of preparing gray oil. Twenty-six grammes of anhydrous wool-fat and 60 grammes of pure liquid paraffin are sterilized separately in glass flasks at 120° C. for 20 minutes. A pestle and mortar are sterilized by means of burning alcohol and placed therein are 40 grammes of mercury and then the wool-fat. The metallic particles are triturated until they are sufficiently minute when examined under a magnification of 480 diameters, and then the liquid paraffin is added in small portions. The product should weigh 126 grammes and measure 100 cubic centimeters, and should be transferred immediately to phials of two, five, and ten cubic centimeters capacity previously sterilized at 180° C.—(Lancet, January 18, 1908.)

### SYPHILIS—INFANTILE.

| | | |
|---|---|---|
| Take of Syrup of iodide of iron | 1 ounce. | 32. |
| Diastasic extract of malt | 2 ounces. | 64. |

Mix. Dose: From one-half to a teaspoonful in milk three times a day.

### SYPHILIS—INFANTILE.

| | | |
|---|---|---|
| Take of Syrup of hydriodic acid | 2 ounces. | 64. |

Dose: From five to twenty drops in water or milk three times a day.

### TUBERCULOSIS OF SKIN.

| | | |
|---|---|---|
| Take of Creosote | ½ drachm. | 2. |
| Syrup of iodide of iron | 3 ounces. | 96. |
| Glycerin | 3 ounces. | 96. |

Mix. Dose: From a half to a teaspoonful in water three times a day.

### TUBERCULOSIS OF SKIN.

| | | |
|---|---|---|
| Take of Codliver oil | 4 ounces. | 128. |
| Oil of eucalyptus | 10 minims. | 0.60 |
| Creosote | 10 minims. | 0.60 |
| Compound spirit of ether | 1 ounce. | 32. |

Mix and make into an emulsion.

Dose: Two teaspoonfuls three times a day.

### TUBERCULOSIS OF SKIN.

| | | |
|---|---|---|
| Take of Codliver oil | 4 ounces. | 128. |
| Glycerin | 4 ounces. | 128. |
| Syrup of hypophosphites | 4 ounces. | 128. |
| Oil of cinnamon | 10 minims. | 0.60 |

Mix and make into an emulsion.

Dose: A tablespoonful three times a day.

### ULCUS—ULCER.

| | | |
|---|---|---|
| Take of Fluidextract of ergot | 2 ounces. | 64. |
| Fluidextract of witch-hazel | 2 ounces. | 64. |
| Fluidextract of geranium | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls in water three or four times a day.

### ULCUS—ULCER.

| | | |
|---|---|---|
| Take of Tartar emetic | 1 grain. | 0.06 |
| Extract of cascara sagrada | 40 grains. | 2.60 |
| Extract of belladonna leaves | 2 grains. | 0.12 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### ULCUS—ULCER.

| | | |
|---|---|---|
| Take of Tincture of phytolacca | 1 drachm. | 4. |
| Tincture of bryonia | 1 drachm. | 4. |
| Tincture of nux vomica | 1 drachm. | 4. |

Mix. Dose: From three to twenty drops in water three or four times a day.

### ULCUS—ULCER.

| | | |
|---|---|---|
| Take of Fluidextract of witch-hazel (hamamelis) | 1 ounce. | 32. |
| Syrup of wild cherry | 1 ounce. | 32. |

Mix. Dose: Thirty drops to one teaspoonful three or four times a day.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Citrate of potassium | ½ ounce. | 16. |
| Bicarbonate of sodium | 3 drachms. | 12. |
| Peppermint-water | 4 ounces. | 128. |

Mix. Dose: One teaspoonful every two or three hours.

### URTICARIA, ACUTE.

Take of Oxalate of cerium..................
Creosote ..........................
Mix and divide into twelve pills.
Dose: One pill every one or two hours.

### URTICARIA, ACUTE.

Take of Bromide of sodium..................
Syrup of orange-flowers..............
Mix. Dose: One tablespoonful in water every

### URTICARIA, ACUTE.

Take of Salicylate of sodium.................
Glycerin ..........................
Water ............................
Mix. Dose: One tablespoonful in water every

### URTICARIA, ACUTE.

Take of Creosote ..........................
Glycerite of pepsin..................
Peppermint-water ..................
Mix. Dose: Two teaspoonfuls before meals.

### URTICARIA, ACUTE.

Take of Lime-water ........................
Soda-water ........................
Mix. Dose: One or two tablespoonfuls every

### URTICARIA, ACUTE.

Take of Tartar emetic .....................
Solution of acetate of ammonium.....
Mix. Dose: Two teaspoonfuls in water every

### URTICARIA, CHRONIC.

Take of Nitrate of silver...................
Extract of gentian..................
Extract of henbane (hyoscyamus)....
Mix and divide into sixteen pills.
Dose: One pill three times a day.

### URTICARIA, CHRONIC.

Take of Oxide of zinc.......................
Extract of calamus..................
Mix and divide into sixteen pills.
Dose: One pill three times a day.

### URTICARIA, CHRONIC.

Take of Arsenic trioxide ...... ............
Aloin .............................
Extract of belladonna leaves..........
Extract of calamus..................
Mix and divide into thirty pills.
Dose: One pill after meals.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Sulphurous acid | 2 ounces. | 64. |
| Syrup of ginger | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls in a wineglassful of water three times a day.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Fluidextract of coto-bark | 1 ounce. | 32. |
| Fluidextract of witch-hazel | 1 ounce. | 32. |

Mix. Dose: One-half to one teaspoonful in water three or four times a day.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Chloride of gold and sodium | 1 grain. | .06 |
| Extract of gentian | 20 grains. | 1.30 |

Mix and divide into twenty pills.

Dose: One pill before meals.

### URTICARIA, CHRONIC.

Take of Sprit of nitroglycerin (alcoholic, 1 to 100).

Dose: From one to five drops in a little water three or four times a day.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Acetanilid | 2 drachms. | 8. |
| Sweet spirit of nitre | 3 ounces. | 96. |

Mix. Dose: One to two teaspoonfuls in water every two or three hours.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Salol (salicylate of phenyl) | 1 drachm. | 4. |
| Lupuline | 12 grains. | 0.72 |
| Sulphate of quinine | 24 grains. | 1.50 |

Mix and divide into twelve capsules.

Dose: One capsule every three or four hours.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Solution of acetate of ammonium | 2 ounces. | 64. |
| Salicylic acid | 1 drachm. | 4. |
| Simple syrup | 1 ounce. | 32. |

Mix. Dose: One teaspoonful in water every hour or two. (Acts as a febrifuge and moderates the eruption.)

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 4 drachms. | 16. |
| Fluidextract of cimicifuga | ½ ounce. | 16. |
| Syrup of tolu | 2½ ounces. | 80. |

Mix. Dose: One teaspoonful in water every four hours. (Moderates the eruption.)

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Powder of ipecacuanha and opium | 40 grains. | 2.60 |
| Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: Two to four every three or four hours.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Hydrate of chloral | 4 drachms. | 16. |
| Solution of acetate of ammonium | 6 ounces. | 192. |

Mix. Dose: One-half to one tablespoonful in water every two or three hours.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Oxalate of cerium | 24 grains. | 1.50 |
| Creosote | 3 minims. | 0.18 |

Mix and divide into twelve pills.
Dose: One pill every one or two hours.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Bromide of sodium | 5 drachms. | 20. |
| Syrup of orange-flowers | 5 ounces. | 160. |

Mix. Dose: One tablespoonful in water every two or three hours.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Salicylate of sodium | 200 grains. | 12. |
| Glycerin | 1 ounce. | 32. |
| Water | 4 ounces. | 128. |

Mix. Dose: One tablespoonful in water every two or three hours.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Creosote | 3 minims. | 0.18 |
| Glycerite of pepsin | 2 ounces. | 32. |
| Peppermint-water | 2 ounces. | 32. |

Mix. Dose: Two teaspoonfuls before meals.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Lime-water | 4 ounces. | 128. |
| Soda-water | 4 ounces. | 128. |

Mix. Dose: One or two tablespoonfuls every hour or two until relieved.

### URTICARIA, ACUTE.

| | | |
|---|---|---|
| Take of Tartar emetic | 1 grain. | 0.06 |
| Solution of acetate of ammonium | 5 ounces. | 160. |

Mix. Dose: Two teaspoonfuls in water every one or two hours.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Nitrate of silver | 2 grains. | 0.12 |
| Extract of gentian | 30 grains. | 2. |
| Extract of henbane (hyoscyamus) | 2 grains. | 0.12 |

Mix and divide into sixteen pills.
Dose: One pill three times a day.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Oxide of zinc | 4 grains. | 0.24 |
| Extract of calamus | 16 grains. | 1. |

Mix and divide into sixteen pills.
Dose: One pill three times a day.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Arsenic trioxide | 1 grain. | 0.06 |
| Aloin | 5 grains. | 0.30 |
| Extract of belladonna leaves | 2 grains. | 0.12 |
| Extract of calamus | 40 grains. | 2.60 |

Mix and divide into thirty pills.
Dose: One pill after meals.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Sulphurous acid | 2 ounces. | 64. |
| Syrup of ginger | 2 ounces. | 64. |

Mix. Dose: One to two teaspoonfuls in a wineglassful of water three times a day.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Fluidextract of coto-bark | 1 ounce. | 32. |
| Fluidextract of witch-hazel | 1 ounce. | 32. |

Mix. Dose: One-half to one teaspoonful in water three or four times a day.

### URTICARIA, CHRONIC.

| | | |
|---|---|---|
| Take of Chloride of gold and sodium | 1 grain. | .06 |
| Extract of gentian | 20 grains. | 1.30 |

Mix and divide into twenty pills.

Dose: One pill before meals.

### URTICARIA, CHRONIC.

Take of Sprit of nitroglycerin (alcoholic, 1 to 100).

Dose: From one to five drops in a little water three or four times a day.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Acetanilid | 2 drachms. | 8. |
| Sweet spirit of nitre | 3 ounces. | 96. |

Mix. Dose: One to two teaspoonfuls in water every two or three hours.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Salol (salicylate of phenyl) | 1 drachm. | 4. |
| Lupuline | 12 grains. | 0.72 |
| Sulphate of quinine | 24 grains. | 1.50 |

Mix and divide into twelve capsules.

Dose: One capsule every three or four hours.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Solution of acetate of ammonium | 2 ounces. | 64. |
| Salicylic acid | 1 drachm. | 4. |
| Simple syrup | 1 ounce. | 32. |

Mix. Dose: One teaspoonful in water every hour or two. (Acts as a febrifuge and moderates the eruption.)

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Chlorate of potassium | 4 drachms. | 16. |
| Fluidextract of cimicifuga | ½ ounce. | 16. |
| Syrup of tolu | 2½ ounces. | 80. |

Mix. Dose: One teaspoonful in water every four hours. (Moderates the eruption.)

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Powder of ipecacuanha and opium | 40 grains. | 2.60 |
| Sulphate of quinine | 40 grains. | 2.60 |

Mix and divide into twenty pills.

Dose: Two to four every three or four hours.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Hydrate of chloral | 4 drachms. | 16. |
| Solution of acetate of ammonium | 6 ounces. | 192. |

Mix. Dose: One-half to one tablespoonful in water every two or three hours.

### VERRUCA—WART.

| | | |
|---|---|---|
| Take of Carbonate of magnesium | 1 to 10 drachms. | 4. to 40. |

Divide into twelve powders.

Dose: One powder in syrup, or milk, four times a day.

### VERRUCA—WART.

| | | |
|---|---|---|
| Take of Carbonate of magnesium | 2 drachms. | 8. |
| Sublimed sulphur | 4 drachms. | 16. |
| Syrup of senna | 6 ounces. | 192. |

Mix. Dose: One dessertspoonful morning and night.

### VERRUCA—WART.

Take of Sulphate of magnesium (saturated solution)

Dose: Ten to thirty drops three times a day in a wineglassful of water.

### VERRUCA—WART.

| | | |
|---|---|---|
| Take of Tartrate of iron and potassium | 40 grains. | 2.60 |
| Arsenic trioxide | 1 grain. | 0.06 |

Mix and divide into twenty pills.

Dose: One pill three times a day.

### VERRUCA—WART.

| | | |
|---|---|---|
| Take of Fluidextract of thuja | 1 ounce. | 32. |

Dose: Five to twenty drops in water three times a day. The same remedy may be applied locally.

### VITILIGO—LEUCODERMA.

| | | |
|---|---|---|
| Take of Sulphide of arsenic | 1 grain. | 0.06 |
| Lactate of iron | 30 grains. | 2. |

Mix and divide into fifteen pills.

Dose: One pill three times a day.

### VITILIGO—LEUCODERMA.

| | | |
|---|---|---|
| Take of Pyrophosphate of iron | 20 grains. | 1.30 |
| Sulphate of quinine | 20 grains. | 1.30 |
| Arsenic trioxide | 1 grain. | 0.06 |
| Extract of nux vomica | 2 grains. | 0.12 |

Mix and divide into thirty pills.

Dose: One pill after meals.

## *EXTERNAL.*

### ACNE.

| | | |
|---|---|---|
| Take of Hydrochloride of hydrastinin | 5 grains. | 0.30 |
| Carbonate of zinc | 1 drachm. | 4. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### ACNE.

| | | |
|---|---|---|
| Take of Hydrochloride of hydrastinin | 6 grains. | 0.36 |
| Boric-acid ointment | 1 ounce. | 32. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 10 grains. | 0.60 |
| | Calomel ointment | 1 ounce. | 32. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Oil of eucalyptus | 5 minims. | 0.30 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Iodide of sulphur ointment | ½ ounce. | 16. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Europhen | ½ drachm. | 2. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Fluidextract of coca | 1 drachm. | 4. |
| | Ointment of oleate of zinc | 2 drachms. | 8. |
| | Ointment of rose-water | 4 drachms. | 16. |

Mix. Beneficial in soothing acne spots.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 10 grains. | 0.60 |
| | ublimed sulphur | 1 scruple. | 1.30 |
| | Simple ointment | 1 ounce. | 32. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Ointment of nitrate of mercury | 3 drachms. | 12. |
| | Oil of chamomile | 5 minims. | 0.30 |
| | Ointment of oxide of zinc | 5 drachms. | 20. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Tincture of witch-hazel | ½ ounce. | 16. |
| | Spirit of lavender | 1 drachm. | 4. |
| | Soft soap | 2 drachms. | 8. |
| | Alcohol | 4 ounces. | 128. |

Mix. To stimulate indurated acne spots.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | 20 grains. | 1.30 |
| | Ammoniated mercury | 10 grains. | 0.60 |
| | Oil of camphor | 5 minims. | 0.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Distilled witch-hazel | 2 ounces. | 64. |
| | Rose-water | 3 ounces. | 96. |

Mix. Use especially in black-heads, or acne punctata.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Phenol, or carbolic acid | 2 grains. | 0.12 |
| | Ointment of oleate of lead | 2 drachms. | 8. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | ½ drachm. | 2. |
| | Thymol | 3 grains. | 0.18 |
| | Oleate of zinc | 1 scruple. | 1.30 |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Ammoniated mercury | 5 grains. | 0.30 |
| | Oil of chamomile | 4 minims. | 0.24 |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | 1 scruple. | 1.30 |
| | Oil of juniper | 10 minims. | 0.60 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Tincture of benzoin | 1 drachm. | 4. |
| | Corrosive sublimate | 5 grains. | 0.30 |
| | Glycerin | 2 ounces. | 64. |
| | Water | 2 ounces. | 64. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide | ½ drachm. | 2. |
| | Ointment of rose-water | ½ ounce. | 16. |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Precipitated sulphur | ½ drachm. | 2. |
| | Ointment of oxide of zinc | ½ ounce. | 16. |
| | Salicylated camphor ointment | ½ ounce. | 16. |

Mix.

### ACNE.

| | | | |
|---|---|---|---|
| Take of | Tincture of soft soap | 3 ounces. | 96. |

Use in obstinate cases of acne—add a teaspoonful to one or two tablespoonfuls of water, and sponge over the surface every second or third day.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Bicarbonate of sodium | 2 drachms. | 8. |
| | Water of ammonia | 1 ounce. | 32. |
| | Tincture of cantharides | 4 drachms. | 16. |
| | Spirit of rosemary | 4 drachms. | 16. |
| | Oil of nutmeg (myristica) | 15 minims. | 1. |
| | Water of Cologne, sufficient quantity to make | 10 ounces. | 320. |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Fluid oleate of mercury | 1½ ounce. | 48. |
| | Oil of ergot | 1½ ounce. | 48. |
| | Oil of rose | 2 minims. | 0.12 |
| | Oil of bergamot | 4 minims. | 0.24 |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Eucalyptus-leaves | ½ ounce. | 16. |
| | Lard | 2 ounces. | 64. |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Aromatic spirit of ammonia | ½ ounce. | 16. |
| | Tincture of capsicum | ½ ounce. | 16. |
| | Spirit of lavender | 1 ounce. | 32. |
| | Tincture of nux vomica | ½ ounce. | 16. |
| | Camphor liniment | 2½ ounces. | 80. |

Mix. Apply with friction to the scalp once or twice a day.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Fluidextract of pilocarpus | ½ ounce. | 16. |
| | Soap liniment | ½ ounce. | 16. |
| | Cologne-water | 2 ounces. | 64. |

Mix. Apply with friction.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Brandy | 4 ounces. | 128. |
| | Tincture of nux vomica | ½ ounce. | 16. |
| | Tincture of capsicum | ½ ounce. | 16. |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Tincture of saponaria | 2 ounces. | 64. |
| | Tincture of capsicum | ½ ounce. | 16. |
| | Spirit of rosemary | 1½ ounce. | 48. |
| | Cologne-water | 1 ounce. | 32. |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Purified wool-fat | ½ ounce. | 16. |
| | Lard | ½ ounce. | 16. |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Tincture of benzoin | 2 drachms. | 8. |
| | Spirit of chloroform | 1 ounce. | 32. |
| | Tincture of nux vomica | 2 drachms. | 8. |
| | Alcohol | 2½ ounces. | 80. |

Mix.

### ALOPECIA.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | ½ ounce. | 16. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Resorcinol | 1 drachm. | 4. |
| | Alcohol | 4 ounces. | 128. |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Fluidextract of pilocarpus | 1 ounce. | 32. |
| | Spirit of ammonia | ½ ounce. | 16. |
| | Soap liniment | 1½ ounce. | 48. |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | ½ ounce. | 16. |
| | Oil of chamomile | 10 minims. | 0.60 |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Thymol | ½ drachm. | 2. |
| | Castor oil | 2 ounces. | 64. |
| | Sweet almond oil | 2 ounces. | 64. |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Oil of turpentine | ½ ounce. | 16. |
| | Soap liniment | 4 ounces. | 128. |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Phenol | 6 grains. | 0.36 |
| | Cantharides ointment | 1 ounce. | 32. |

Mix.

### ALOPECIA CIRCUMSCRIPTA—ALOPECIA AREATA.

| | | | |
|---|---|---|---|
| Take of | Thymol | 5 grains. | 0.30 |
| | Extract of nux vomica | ½ drachm. | 2. |
| | Cantharides ointment | 1 ounce. | 32. |

Mix.

### ANIDROSIS—A DECREASED OR COMPLETE CESSATION OF THE SECRETION OF SWEAT.

| | | | |
|---|---|---|---|
| Take of | Purified wool-fat | ½ ounce. | 16. |
| | Oil of eucalyptus | 10 minims. | 0.60 |
| | Lard | 1½ ounce. | 48. |

Mix.

### ANTHRAX—MALIGNANT PUSTULE.

| | | | |
|---|---|---|---|
| Take of | Sulphate of quinine | ½ ounce. | 16. |
| | Phenol | 5 grains. | 0.30 |
| | Powdered arrow-root | ½ ounce. | 16. |
| | Oil of turpentine, a sufficient quantity to make into a paste. | | |

Mix.

### ANTHRAX—MALIGNANT PUSTULE.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | ½ drachm. | 2. |
| | Carbonate of lead | 1 drachm. | 4. |
| | Camphor | ½ drachm. | 2. |
| | Benzoinated lard | 1 ounce. | 32. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Sulphate of zinc | 8 grains. | 0.50 |
| | Phenol | 5 grains. | 0.30 |
| | Glycerin | 6 ounces. | 192. |

Mix. Apply with old muslin or lint.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 1 drachm. | 4. |
| | Powdered oleate of zinc | 4 drachms. | 16. |
| | Powdered arrow-root | ½ ounce. | 16. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Dried alum | 2 ounces. | 64. |
| | Powdered oleate of zinc | 2 drachms. | 8. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | 2 drachms. | 8. |
| | Subnitrate of bismuth | ½ ounce. | 16. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Salicylate of phenyl | ½ drachm. | 2. |
| | Powdered alum | 1 drachm. | 4. |
| | Subnitrate of bismuth | 1 drachm. | 4. |
| | Oxide of zinc ointment | 1 ounce. | 32. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Powdered alum | ½ ounce. | 16. |
| | Glycerin | 2 ounces. | 64. |
| | Distilled witch-hazel | 4 ounces. | 128. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Purified wool-fat | ½ ounce. | 16. |
| | Boric-acid ointment | ½ ounce. | 16. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Tincture of witch-hazel | 2 ounces. | 64. |
| | Rose-water | 1 ounce. | 32. |

Mix.

### BROMIDROSIS—ODOROUS SWEAT.

| | | | |
|---|---|---|---|
| Take of | Permanganate of potassium | 10 grains. | 0.60 |
| | Spirit of rosemary | 2 drachms. | 8. |
| | Alcohol | 4 ounces. | 128. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | | |
|---|---|---|---|
| Take of | Phenol | 12 grains. | 0.72 |
| | Iodine | 4 drachms. | 16. |
| | Glycerin | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | | |
|---|---|---|---|
| Take of | Lead plaster | 6 drachms. | 24. |
| | Turpentine | 2 drachms. | 8. |
| | Galbanum | 4 drachms. | 16. |
| | Extract of opium | ½ drachm. | 2. |

Mix and make into plaster.

### CARBUNCULUS—CARBUNCLE.

| | | | |
|---|---|---|---|
| Take of | Extract of belladonna leaves | ½ drachm. | 2. |
| | Extract of opium | 10 grains. | 0.60 |
| | Ointment of nitrate of mercury | ½ ounce. | 16. |
| | Cerate of subacetate of lead | ½ ounce. | 16. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Extract of conium | 1 drachm. | 4. |
| Ointment of mercury oleate | 4 drachms. | 16. |
| Resin cerate | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Honey | 2 drachms. | 8. |
| Extract of arnica | 1 drachm. | 4. |
| Resin cerate | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Belladonna ointment | 1 drachm. | 4. |
| Purified wool-fat | ½ ounce. | 16. |
| Cerate of subacetate of lead | 3 drachms. | 12. |
| Cocaine hydrochloride | 5 grains. | 0.30 |
| Zinc ointment | ½ ounce. | 16. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Powdered poke-root | 1 drachm. | 4. |
| Compound resin ointment | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Iodide of thymol | 1 drachm. | 4. |
| Camphor | 20 grains. | 1.30 |
| Phenol | 15 grains. | 1. |
| Subnitrate of bismuth | 2 drachms. | 8. |
| Rose-water ointment | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Extract of stramonium | 1 drachm. | 4. |
| Camphor | 1 drachm. | 4. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### CARBUNCULUS—CARBUNCLE.

| | | |
|---|---|---|
| Take of Phenol | ½ drachm. | 2. |
| Tincture of witch-hazel | 2 ounces. | 64. |
| Water | 1 pint. | 512. |

Mix.

### CHANCROID.

| | | |
|---|---|---|
| Take of Iodol (pyrrol tetraiodide) | 2 drachms. | 8. |
| Subnitrate of bismuth | ½ ounce. | 16. |

Mix.

### CHANCROID.

| | | |
|---|---|---|
| Take of Subiodide of bismuth | ½ ounce. | 16. |
| Powdered red cinchona bark | ½ ounce. | 16. |

Mix.

### CHANCROID.

| | | |
|---|---|---|
| Take of Powdered chlorate of potassium | ½ ounce. | 16. |
| Carbonate of lead | 1 ounce. | 32. |
| Sulphate of morphine | 2 grains. | 0.12 |

Mix.

### CHANCROID.

| | | | |
|---|---|---|---|
| Take of | Iodoform | ½ ounce. | 16. |
| | Powdered coffee (recently roasted) | ½ ounce. | 16. |

Mix.

### CHANCROID.

| | | | |
|---|---|---|---|
| Take of | Hydrate of chloral | 10 grains. | 0.60 |
| | Tincture of witch-hazel | 1 drachm. | 4. |
| | Tincture of arnica | 1 drachm. | 4. |
| | Water | 10 ounces. | 320. |

Mix.

### CHANCROID.

| | | | |
|---|---|---|---|
| Take of | Creosote | 3 minims. | 0.18 |
| | Corrosive sublimate | 4 grains. | 0.24 |
| | Glycerin | 2 ounces. | 64. |
| | Rose-water | 3 ounces. | 96. |

Mix.

### CHANCROID.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 5 grains. | 0.30 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | White precipitate | 10 grains. | 0.60 |
| | Atropine ointment | ½ ounce. | 16. |

Mix.

### CHANCROID.

| | | | |
|---|---|---|---|
| Take of | Europhen | ½ ounce. | 16. |
| | Carbonate of zinc | ½ ounce. | 16. |

Mix.

### CHANCROID.

| | | | |
|---|---|---|---|
| Take of | Subgallate of bismuth | 1 ounce. | 32. |

### CHLOASMA.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury (five to ten per cent.) | 1 ounce. | 32. |
| | Oil of eucalyptus | 10 minims. | 0.60 |

Mix.

### CHLOASMA.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 2 drachms. | 8. |
| | Distilled witch-hazel | 2 ounces. | 64. |
| | Cologne-water | 2 ounces. | 64. |

Mix.

### CHLOASMA.

| | | | |
|---|---|---|---|
| Take of | Iodol | 1 drachm. | 4. |
| | White precipitate ointment | 1 ounce. | 32. |

Mix.

### CHLOASMA.

| | | | |
|---|---|---|---|
| Take of | Chrysarobin | 2 scruples. | 2.60 |
| | Benzoinated lard | 1 ounce. | 32. |

Mix.

### CHLOASMA.

| | | | |
|---|---|---|---|
| Take of | Corrosive sublimate | 10 grains. | 0.60 |
| | Chloride of ammonium | 1 drachm. | 4. |
| | Alcohol | 1 ounce. | 32. |
| | Distilled witch-hazel | 3 ounces. | 96. |

Mix.

### CICATRICES—SCARS.

Take of Iodide of potassium....................
Purified wool-fat ....................
Mix.

### CICATRICES—SCARS.

Take of Red iodide of mercury ointment.......
Purified wool-fat ....................
Mix.

### CICATRICES—SCARS.

Take of Green (soft) soap....................
Compound iodine ointment............
Mix.

### CLAVUS—CORN.

Take of Sulphuric ether ......................
Extract of Indian hemp...............
Salicylate of phenyl..................
Mix.

### CLAVUS—CORN.

Take of Salicylic acid .......................
Flexible collodion ..................
Mix. Pencil over the corn night and morning.

### COMBUSTIO—BURN—SCAL

Take of Prepared lime .......................
Liquefied phenol ....................
Olive oil ..........................
Lime-water .........................
Mix.

### COMBUSTIO—BURN—SCAL

Take of Carbonate of lead.....................
Creosote ..........................
Carbonate of zinc....................
Rose-water ointment .................
Mix.

### COMBUSTIO—BURN—SCAL

Take of Prepared suet .......................
Resin cerate ........................
Powdered arrow-root .................
Linseed oil .........................
Mix.

### COMBUSTIO—BURN—SCAL

Take of Cerate of subacetate of lead...........
Pure cocaine ........................
Ointment of oxide of zinc............
Mix.

### COMBUSTIO—BURN—SCAL

Take of Distilled witch-hazel .................
Solution of subacetate of lead.........
Tincture of opium....................
Water .............................
Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Pure cocaine | 5 grains. | 0.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Pure cocaine | 8 grains. | 0.50 |
| | Olive oil | 4 ounces. | 128. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Iodoform | ½ drachm. | 2. |
| | Bicarbonate of sodium | 40 grains. | 2.60 |
| | Ointment of rose-water | 2 ounces. | 64. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Bicarbonate of sodium | ½ ounce. | 16. |
| | Water | 1 pint. | 512. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Salicylate of sodium | ½ drachm. | 2. |
| | Olive oil | 5 ounces. | 160. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Phenol | 15 grains. | 1. |
| | Fluidextract of marigold (calendula) N. F. | ½ ounce. | 16. |
| | Olive oil | ½ pint. | 256. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Fluidextract of grindelia | ½ ounce. | 16. |
| | Creolin | 2 drachms. | 8. |
| | Water | 5 ounces. | 160. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Subnitrate of bismuth | 2 drachms. | 8. |
| | Powdered arrow-root | ½ ounce. | 16. |
| | Sulphate of morphine | 3 grains. | 0.18 |
| | Purified wool-fat | ½ ounce. | 16. |
| | Rose-water ointment | 1 ounce. | 32. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Cocaine | 15 grains. | 1. |
| | Purified wool-fat | 1 ounce. | 32. |
| | Bicarbonate of sodium | 2 drachms. | 8. |
| | Olive oil | 6 ounces. | 192. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 ounce. | 32. |
| | Water | ½ pint. | 256. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Carbonate of lead | 2 ounces. | 64. |
| | Olive oil, enough to make a soft ointment. | | |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Cocaine | 10 grains. | 0.60 |
| | Purified wool-fat | 1 ounce. | 32. |
| | Carbonate of lead | 2 drachms. | 8. |
| | Olive oil | 5 ounces. | 160. |

Mix.

### COMBUSTIO—BURN—SCALD.

| | | | |
|---|---|---|---|
| Take of | Levigated calamine | 4 drachms. | 16. |
| | Subnitrate of bismuth | 2 drachms. | 8. |
| | Simple ointment | 1 ounce. | 32. |

Mix.

### COMEDO—SEBACEOUS PLUGS OR GRUBS.

| | | | |
|---|---|---|---|
| Take of | Tincture of green soap | 2 ounces. | 64. |
| | Thymol | 5 grains. | 0.30 |
| | Water | 4 ounces. | 128. |

Mix.

### COMEDO—SEBACEOUS PLUGS OR GRUBS.

| | | | |
|---|---|---|---|
| Take of | Spirit of lavender | 1 drachm. | 4. |
| | Spirit of rosemary | 1 ounce. | 32. |
| | Water | 4 ounces. | 128. |

Mix.

### COMEDO—SEBACEOUS PLUGS OR GRUBS.

| | | | |
|---|---|---|---|
| Take of | Soap liniment | 2 ounces. | 64. |
| | Water of ammonia | ½ ounce. | 16. |
| | Water | 5 ounces. | 160. |

Mix.

### COMEDO—SEBACEOUS PLUGS OR GRUBS.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 20 grains. | 1.30 |
| | Turpentine ointment | 1 ounce. | 32. |

Mix.

### COMEDO—SEBACEOUS PLUGS OR GRUBS.

| | | | |
|---|---|---|---|
| Take of | Oil of cade | 1 drachm. | 4. |
| | Iodide of sulphur ointment | 1 ounce. | 32. |

Mix.

### CONDYLOMATA.

| | | | |
|---|---|---|---|
| Take of | Iodol (pyrrol tetraiodide) | 2 drachms. | 8. |
| | Subnitrate of bismuth | 3 drachms. | 12. |

Mix.

### CONDYLOMATA.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide | 2 drachms. | 8. |
| | Calomel | ½ drachm. | 2. |

Mix.

### CONDYLOMATA.

| | | | |
|---|---|---|---|
| Take of | Calomel | 3 drachms. | 12. |
| | Subnitrate of bismuth | 3 drachms. | 12. |

Mix.

### CONDYLOMATA.

| | | | |
|---|---|---|---|
| Take of | Tannic acid | 1 drachm. | 4. |
| | Camphor | ½ drachm. | 2. |
| | Ointment of nitrate of mercury | 2 drachms. | 8. |
| | Purified wool-fat | 4 drachms. | 16. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Purified chloroform (by weight) | ½ ounce. | 16. |
| | Tincture of opium | ½ ounce. | 16. |
| | Tincture of aconite | ½ ounce. | 16. |
| | Alcohol | ½ ounce. | 16. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of lead | ½ ounce. | 16. |
| | Extract of opium | 10 grains. | 0.60 |
| | Extract of belladonna leaves | 10 grains. | 0.60 |
| | Extract of arnica | ½ drachm. | 2. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Tincture of witch-hazel | 2 ounces. | 64. |
| | Tincture of opium | 2 ounces. | 64. |
| | Solution of subacetate of lead | 2 ounces. | 64. |
| | Water | ½ pint. | 256. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | ½ drachm. | 2. |
| | Carbonate of zinc | 2 drachms. | 8. |
| | Extract of Indian hemp | ½ drachm. | 2. |
| | Balsam-of-Peru ointment | 1 ounce. | 32. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Diluted solution of subacetate of lead | 1 ounce. | 32. |
| | Tincture of opium | 1 ounce. | 32. |
| | Distilled witch-hazel | 2 ounces. | 64. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 5 grains. | 0.30 |
| | Sulphate of atropine | 1 grain. | 0.06 |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Compound tincture of benzoin | 3 drachms. | 12. |
| | Chloroform (by weight) | 2 drachms. | 8. |
| | Tincture of aconite | 1 drachm. | 4. |

Mix.

### CONGELATIO—FROST-BITE.

| | | | |
|---|---|---|---|
| Take of | Ointment of phenol (3 per cent.) | 1 ounce. | 32. |

Apply at night to part afflicted by chilblains.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | | |
|---|---|---|---|
| Take of | Tincture of aconite | 1 drachm. | 4. |
| | Menthol | ½ drachm. | 2. |
| | Spirit of chloroform | 1 ounce. | 32. |
| | Alcohol | 3 ounces. | 96. |

Mix.

### DERMATALGIA—NEURALGIA OF THE SKIN.

| | | | |
|---|---|---|---|
| Take of | Tincture of opium | 2 drachms. | 8. |
| | Tincture of arnica | 2 drachms. | 8. |
| | Creosote | 5 minims. | 0.30 |
| | Soap liniment | 4 ounces. | 128. |

Mix.

### DERMATALGIA.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 12 grains. | 0.76 |
| | Sulphate of atropine | 1 grain. | 0.06 |
| | Liquified phenol | 5 minims. | 0.30 |
| | Oil of chamomile | 10 drops. | 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### DERMATALGIA.

| | | | |
|---|---|---|---|
| Take of | Tincture of belladonna leaves | 1½ drachm. | 6. |
| | Tincture of aconite | 1½ drachm. | 6. |
| | Menthol | ½ drachm. | 2. |
| | Alcohol | 2 ounces. | 64. |
| | Glycerin | ½ ounce. | 16. |
| | Rose-water | ½ ounce. | 16. |

Mix.

### DERMATALGIA.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Carbonate of lead | 1 drachm. | 4. |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Oil of eucalyptus | 4 minims. | 0.24 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### DERMATITIS—INFLAMMATION OF THE SKIN.

| | | | |
|---|---|---|---|
| Take of | Lycopodium | 3 drachms. | 12. |
| | Subnitrate of bismuth | 3 drachms. | 12. |
| | Powdered oleate of zinc | 3 drachms. | 12. |

Mix.

### DERMATITIS—INFLAMMATION OF THE SKIN.

| | | | |
|---|---|---|---|
| Take of | Oleate of iron | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix. Especially valuable in arsenical eruption.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Tannic acid | 1 scruple. | 2.60 |
| | Subnitrate of bismuth | 2 drachms. | 8. |
| | Rose-water | 6 ounces. | 192. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Salicylate of phenyl | 2 drachms. | 8. |
| | Powdered oleate of zinc | 2 drachms. | 8. |
| | Subnitrate of bismuth | 2 ounces. | 64. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 2 drachms. | 8. |
| | Powdered impure carbonate of zinc | 2 ounces. | 64. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Carbonate of zinc | 1 drachm. | 4. |
| | Carbonate of lead | 1 drachm. | 4. |
| | Sublimed sulphur | 1 drachm. | 4. |
| | Powdered arrow-root | 1 drachm. | 4. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Creosote | 10 minims. | 0.60 |
| | Subnitrate of bismuth | 1 ounce. | 32. |
| | Distillate of witch-hazel | 4 ounces. | 128. |
| | Lime-water | 4 ounces. | 128. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Creolin | 10 minims. | 0.60 |
| | Carbonate of lead | 2 drachms. | 8. |
| | Powdered impure carbonate of zinc | 2 drachms. | 8. |
| | Ointment of rose-water | 1½ ounce. | 48. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Carbonate of lead | 4 drachms. | 16. |
| | Powdered starch | 3 drachms. | 12. |
| | Lycopodium | 4 drachms. | 16. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Powdered oleate of zinc | 1 drachm. | 4. |
| | Camphor | 1 drachm. | 4. |
| | Powdered starch | 2 ounces. | 64. |

Mix.

### ECZEMA, ACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Extract of opium | 1 drachm. | 4. |
| | Acetate of lead | 1 scruple. | 1.30 |
| | Subnitrate of bismuth | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### ECZEMA ANI—ECZEMA OF THE ANUS.

| | | | |
|---|---|---|---|
| Take of | Extract of belladonna leaves | 2½ grains. | 0.15 |
| | Extract of opium | 3 grains. | 0.18 |
| | Iodoform, or thymol iodide | 30 grains. | 2. |
| | Oil of theobroma | q. s. | |

Mix and make into ten suppositories.

Insert one into the bowel when necessary to relieve local suffering.

### ECZEMA ANI—ECZEMA OF THE ANUS.

| | | | |
|---|---|---|---|
| Take of | Hydrate of chloral | ½ drachm. | 2. |
| | Camphor | 1 drachm. | 4. |
| | Prepared suet | 1 ounce. | 32. |

Mix.

### ECZEMA ARTICULORUM—ECZEMA OF THE FLEXOR SURFACES OF THE JOINTS.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 5 grains. | 0.30 |
| | Ointment of nitrate of mercury | 2 drachms. | 8. |
| | Oil of chamomile | 5 minims. | 0.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA ARTICULORUM—ECZEMA OF THE FLEXOR SU

Take of Sublimed sulphur
Phenol
Thymol iodide
Ointment of oxide of zinc
Mix.

### ECZEMA AURIUM—ECZEMA OF THE

Take of Ointment of oleate of lead
Oil of cade
Purified wool-fat
Ointment of oxide of zinc
Mix.

### ECZEMA AURIUM—ECZEMA OF THE

Take of Thymol iodide
Ointment of nitrate of mercury
Creolin
Ointment of oxide of zinc
Mix.

### ECZEMA BARBÆ—ECZEMA OF THE

Take of Codliver oil
Carbonate of lead
Betanaphthol
Mix.

### ECZEMA BARBÆ—ECZEMA OF THE

Take of Calomel
Betanaphthol
Camphor
Carbonate of zinc
Ointment of oxide of zinc
Mix.

### ECZEMA CAPITIS—ECZEMA OF THE

Take of Creosote
Calomel
Camphor
Ointment of oxide of zinc
Oilve oil
Mix.

### ECZEMA CAPITIS—ECZEMA OF THE

Take of Codliver oil
Carbonate of lead
Betanaphthol
Mix.

### ECZEMA, CHRONIC—TETTER.

Take of Red oxide of mercury
Sublimed sulphur
Oil of wintergreen
Ointment of oxide of zinc
Mix.

### ECZEMA, CHRONIC—TETTER.

Take of Codliver oil
Oil of cade
Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Creosote | 10 minims. | 0.60 |
| | Carbonate of lead | 2 drachms. | 8. |
| | Subnitrate of bismuth | 1 drachm. | 4. |
| | Calomel | 10 grains. | 0.60 |
| | Olive oil | 5 ounces. | 160. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Calomel | 20 grains. | 1.30 |
| | Acetate of lead | ½ drachm. | 2. |
| | Extract of belladonna leaves | 10 grains. | 0.60 |
| | Subnitrate of bismuth | 1 drachm. | 4. |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Benzoinated lard | 2 ounces. | 64. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 20 grains. | 1.30 |
| | Camphor | 10 grains. | 0.60 |
| | Menthol | 5 grains. | 0.30 |
| | Extract of belladonna leaves | 20 grains. | 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | 30 grains. | 2. |
| | Thymol iodide | 1 drachm. | 4. |
| | Powdered starch | 1 drachm. | 4. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Salicylate of phenyl | 2 drachms. | 8. |
| | Oil of eucalyptus | 20 minims. | 1.30 |
| | Europhen | 1 drachm. | 4. |
| | Ointment of oxide of zinc | 1 ounce. | 4. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Balsam of Peru | 1 drachm. | 4. |
| | Menthol | 10 grains. | 0.60 |
| | Oil of cade | 1 drachm. | 4. |
| | Ointment of nitrate of mercury | ½ ounce. | 16. |
| | Ointment of rose-water | ½ ounce. | 16. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Oil of cade | ½ drachm. | 2. |
| | Ointment of nitrate of mercury | 2 drachms. | 8. |
| | Prepared suet | 1 ounce. | 32. |

Mix.

### ECZEMA, CHRONIC—TETTER.

| | | | |
|---|---|---|---|
| Take of | Ichthyol (sulpho-ichthyolate of sodium) | 2 drachms. | 8. |
| | Oil of eucalyptus | 3 minims. | 0.18 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA, CHRONIC—TETTER.

Take of Ichthyol (sulpho-ichthyolate of sodium)..
Lard ................................
Mix.

### ECZEMA, CHRONIC—TETTER.

Take of Resorcinol ........................ 5 o
Ointment of oxide of zinc..............
Mix.

### ECZEMA CRURUM—ECZEMA OF THI

Take of Ergotin .............................
Sublimed sulphur .....................
Menthol .......................... 5 t
Extract of belladonna leaves...........
Ointment of oxide of zinc...............
Mix.

### ECZEMA CRURUM—ECZEMA OF THI

Take of Oil of cade...........................
Sublimed sulphur .....................
Ointment of oxide of zinc...............
Cerate of subacetate of lead............
Mix.

### ECZEMA FACIEI ET COLLI—ECZEMA OF THE

Take of Thymol iodide .......................
Camphor .............................
Purified wool-fat .....................
Crystals of phenol.....................
Ointment of oxide of zinc...............
Mix.

### ECZEMA FACIEI ET COLLI—ECZEMA OF THE

Take of Ammoniated mercury .................
Arrow-root ...........................
Oil of chamomile......................
Carbonate of zinc......................
Lard ................................
Mix.

### ECZEMA GENITALIUM—ECZEMA OF THE GE

Take of Hydrochloride of cocaine...............
Carbonate of zinc......................
Menthol .............................
Sublimed sulphur ......................
Ointment of rose-water.................
Mix.

### ECZEMA GENITALIUM—ECZEMA OF THE GE

Take of Solution of boro-glyceride (fifty per cent.)
Distilled witch-hazel ..................
Mix.

### ECZEMA GENITALIUM—ECZEMA OF THE GE

Take of Acetate of lead.........................
Calomel ..............................
Ointment of oxide of zinc..............
Mix.

### ECZEMA GENITALIUM—ECZEMA OF THE GENITAL ORGANS.

| | | | |
|---|---|---|---|
| Take of | Yellow oxide of mercury | 10 grains. | 0.60 |
| | Extract of opium | 5 grains. | 0.30 |
| | Camphor | 10 grains. | 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA, INFANTILE—INFANTILE ECZEMA.

| | | | |
|---|---|---|---|
| Take of | Calomel | 10 grains. | 0.60 |
| | Oil of chamomile | 5 minims. | 0.30 |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix. Useful particularly in the pustular variety or milk crust.

### ECZEMA, INFANTILE—INFANTILE ECZEMA.

| | | | |
|---|---|---|---|
| Take of | Carbonate of lead | 1 drachm. | 4. |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Camphor | 1 scruple. | 1.30 |
| | Sublimed sulphur | ½ drachm | 2. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### ECZEMA, INFANTILE, ACUTE.

| | | | |
|---|---|---|---|
| Take of | Oil of chamomile | 6 minims. | 0.36 |
| | Calomel | 10 grains. | 0.60 |
| | Oil of eucalyptus | 5 minims. | 0.30 |
| | Purified wool-fat | ½ ounce. | 16. |
| | Zinc ointment | ½ ounce. | 16. |

Mix.

### ECZEMA, INFANTILE, ACUTE.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Betanaphthol | 5 grains. | 0.30 |
| | Camphor | 5 grains. | 0.30 |
| | Rose-water ointment | 1 ounce. | 32. |

Mix.

### ECZEMA, INFANTILE, ACUTE.

| | | | |
|---|---|---|---|
| Take of | Boric acid | ½ drachm. | 2. |
| | Purified wool-fat | ½ ounce. | 16. |
| | Creolin | 5 grains. | 0.30 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Powdered arrow-root | 1 drachm. | 4. |

Mix.

### ECZEMA INTERTRIGO.

| | | | |
|---|---|---|---|
| Take of | Oleate of zinc | 2 drachms. | 8. |
| | Glycerin | 2 ounces. | 64. |
| | Olive oil | 2 ounces. | 64. |

Mix.

### ECZEMA LABIORUM—ECZEMA OF THE LABIA.

| | | | |
|---|---|---|---|
| Take of | Calomel | 10 grains. | 0.60 |
| | Benzoate of sodium | 10 grains. | 0.60 |
| | Prepared suet | ½ ounce. | 16. |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### ECZEMA LABIORUM—ECZEMA OF TH

Take of Extract of opium
Powdered stramonium
Powdered tobacco
Camphor
Ointment of elder-flowers (sambucus)
Mix.

### ECZEMA LABIORUM—ECZEMA OF TH

Take of Camphor
Betanaphthol
Oil of chamomile
Subnitrate of bismuth
Ointment of oxide of zinc
Mix.

### ECZEMA LABIORUM—ECZEMA OF TH

Take of Prepared suet
Camphor
Subnitrate of bismuth
Mix.

### ECZEMA LINGUÆ—ECZEMA OF THE

Take of Tincture of iodine
Glycerin
Betanaphthol
Mix.

### ECZEMA MAMMARUM—ECZEMA OF TH

Take of Boric acid
Sublimed sulphur
Ointment of oxide of zinc
Mix.

### ECZEMA MAMMARUM—ECZEMA OF TH

Take of Powdered borax
Powdered camphor
Powdered oleate of zinc
Powdered arrow-root
Mix.

### ECZEMA MAMMARUM—ECZEMA OF THE BREA

Take of Fluidextract of geranium
Glycerin
Mix.

### ECZEMA MAMMARUM—ECZEMA OF THE BREA

Take of Camphor
Carbonate of zinc
Sublimed sulphur
Oil of eucalyptus
Creosote
Ointment of rose-water
Purified wool-fat
Mix.

### ECZEMA MANUUM ET PEDUM—ECZEMA OF THE HANDS AND FEET.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 10 grains. | 0.60 |
| | Extract of belladonna leaves | 10 grains. | 0.60 |
| | Ointment of nitrate of mercury | 3 drachms. | 12. |
| | Benzoinated lard | 1 ounce. | 32. |

Mix.

### ECZEMA MANUUM ET PEDUM—ECZEMA OF THE HANDS AND FEET.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | ½ drachm. | 2. |
| | Extract of ergot | 1 scruple. | 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA MANUUM ET PEDUM—ECZEMA OF THE HANDS AND FEET.

| | | | |
|---|---|---|---|
| Take of | Balsam of Peru | ½ drachm. | 2. |
| | Ointment of nitrate of mercury | ½ ounce. | 16. |
| | Oil of cade | ½ drachm. | 2. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### ECZEMA MANUUM ET PEDUM—ECZEMA OF THE HANDS AND FEET.

| | | | |
|---|---|---|---|
| Take of | Salicylate of phenyl | 1 drachm. | 4. |
| | Ointment of nitrate of mercury | ½ ounce. | 16. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### ECZEMA MANUUM ET PEDUM—ECZEMA OF THE HANDS AND FEET.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide | ½ to 2 drachms. | 2. to 8. |
| | Ointment of nitrate of mercury | ½ ounce. | 16. |
| | Betanaphthol | 10 grains. | 0.60 |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### ECZEMA NASI—ECZEMA OF THE NOSE.

| | | | |
|---|---|---|---|
| Take of | Glycerole of subacetate of lead | 1 ounce. | 32. |
| | Chaulmoogra oil | ½ ounce. | 16. |
| | Oil of eucalyptus | 5 minims. | 0.30 |
| | Glycerin | ½ ounce. | 16. |

Mix.

### ECZEMA NASI—ECZEMA OF THE NOSE.

| | | | |
|---|---|---|---|
| Take of | Acetate of lead | 10 to 20 grains. | 0.60 to 1.30 |
| | Sulphate of morphine | 5 grains. | 0.30 |
| | Menthol | 10 grains. | 0.60 |
| | Creosote | 10 minims. | 0.60 |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA SCROTI—ECZEMA OF THE SCROTUM.

| | | | |
|---|---|---|---|
| Take of | Extract of belladonna leaves | ½ drachm. | 2. |
| | Extract of opium | 10 grains. | 0.60 |
| | Tannic acid | 1 scruple. | 1.30 |
| | Ointment of nitrate of mercury | 2 drachms. | 8. |

Mix.

### ECZEMA SCROTI—ECZEMA OF THE SCROTUM.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Cucumber ointment | 1 ounce. | 32. |

Mix.

### ECZEMA SCROTI ET ANI—ECZEMA OF THE SCROTUM AND ANUS.

| | | | |
|---|---|---|---|
| Take of | Boroglyceride (50-per-cent. solution) | ½ ounce. | 16. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### ECZEMA SCROTI ET ANI—ECZEMA OF THE SCROTUM AND ANUS.

| | | | |
|---|---|---|---|
| Take of | Boric acid | ½ drachm. | 2. |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Salicylated camphor | 20 grains. | 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA, SUBACUTE—TETTER.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | 1 drachm. | 4. |
| | Boric acid | 1 drachm. | 4. |
| | Simple ointment | 1 ounce. | 32. |

Mix.

### ECZEMA TARSI—ECZEMA OF THE EDGES OF THE EYELIDS.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide, or Europhen | 5 to 10 grains. | 0.30 to 0.60 |
| | Ointment of rose-water | 4 drachms. | 16. |

Mix.

### ECZEMA TARSI—ECZEMA OF THE EDGES OF THE EYELIDS.

| | | | |
|---|---|---|---|
| Take of | Yellow oxide of mercury | 5 grains. | 0.30 |
| | Ointment of rose-water | 3 drachms. | 12. |

Mix.

### ECZEMA UMBILICI—ECZEMA OF THE UMBILICUS.

| | | | |
|---|---|---|---|
| Take of | Tannic acid | ½ drachm. | 2. |
| | Extract of belladonna leaves | 20 grains. | 1.30 |
| | Hydrochloride of cocaine | 5 grains. | 0.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ECZEMA UMBILICI—ECZEMA OF THE UMBILICUS.

| | | | |
|---|---|---|---|
| Take of | Thymol | 1 grain. | 0.06 |
| | Powdered red cinchona bark | 3 drachms. | 12. |
| | Subnitrate of bismuth | 3 drachms. | 12. |

Mix.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Chloride of zinc | 5 grains. | 0.30 |
| | Sublimed sulphur | 1 scruple. | 1.30 |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Arsenic trioxide | 10 grains. | 0.60 |
| | Simple ointment | 1 ounce. | 32. |

Mix. Spread the ointment on an old piece of muslin and apply constantly to the part.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Phenol | 3 grains. | 0.18 |
| | Purified wool-fat | 2 drachms. | 8. |

Mix.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Oleate of arsenic | 5 to 10 grains. | 0.30 to 0.60 |
| | Chloride of zinc | 5 grains. | 0.30 |
| | Powdered arrow-root | ½ drachm. | 2. |
| | Extract of belladonna leaves | 5 grains. | 0.30 |
| | Extract of opium | 10 grains. | 0.60 |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Oleate of arsenic | 5 grains. | 0.30 |
| | Ointment of oleate of mercury | 1 drachm. | 4. |
| | Simple ointment | 1 ounce. | 32. |

Mix.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Sulphate of atropine | 4 grains. | 0.24 |
| | Sulphate of morphine | 4 grains. | 0.24 |
| | Distilled witch-hazel | 2 ounces. | 64. |
| | Water | 3 ounces. | 96. |

Mix. Use on old muslin, or patent lint, and renew application frequently for the relief of pain.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Powdered chlorate of potassium | ½ ounce. | 16. |
| | Powdered ergot | ½ ounce. | 16. |

Mix. Dust over the surface.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Powdered chlorate of potassium | 1 drachm. | 4. |
| | Sulphate of morphine | 4 grains. | 0.24 |
| | Sulphate of atropine | 1 grain. | 0.06 |
| | Ergot ointment | 1 ounce. | 32. |

Mix.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 5 grains. | 0.30 |
| | Ointment of belladonna | 1 ounce. | 32. |

Mix.

### EPITHELIOMA—EPITHELIAL CANCER.

| | | | |
|---|---|---|---|
| Take of | Extract of conium | 1 drachm. | 4. |
| | Menthol | 10 grains. | 0.60 |
| | Extract of belladonna leaves | 10 grains. | 0.60 |
| | Ointment of oxide of zinc | ½ ounce. | 16. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 4 grains. | 0.24 |
| | Glycerole of lead | 2 ounces. | 64. |
| | Distillate of witch-hazel | 2 ounces. | 64. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Tincture of iodine | ½ drachm. | 2. |
| | Liquefied phenol | ½ drachm | 2. |
| | Glycerin | 4 ounces. | 128. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Carbonate of lead | 2 ounces. | 64. |
| | Creosote | 10 minims. | 0.60 |
| | Olive oil, sufficient quantity to make a very soft ointment. | | |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Oil of chamomile | 10 minims. | 0.60 |
| | Subnitrate of bismuth | 2 drachms. | 8. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Carbonate of lead | 1 drachm. | 4. |
| | Resorcinol ointment | 1 ounce. | 32. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Subnitrate of bismuth | 1 drachm. | 4. |
| | Carbonate of lead | 2 drachms. | 8. |
| | Creosote | 3 minims. | 0.18 |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Tincture of chloride of iron | 1 ounce. | 32. |
| | Compound tincture of cinchona | 1 ounce. | 32. |
| | Glycerin | 1 ounce. | 32. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Yellow oxide of mercury | 10 grains. | 0.60 |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Acetate of lead | 1 scruple. | 1.30 |
| | Infusion of digitalis | ½ pint. | 256. |

Mix.

### ERYSIPELAS.

| | | | |
|---|---|---|---|
| Take of | Oxide-of-zinc ointment | ½ ounce. | 16. |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Powdered starch | 1 drachm. | 4. |
| | Witch-hazel ointment | 1 ounce. | 32. |

Mix.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Creosote | 8 minims. | 0.50 |
| | Calomel | 10 grains. | 0.60 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Powdered starch | 2 ounces. | 64. |
| | Subnitrate of bismuth | 1 ounce. | 32. |
| | Thymol iodide | 30 grains. | 2. |

Mix.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Borax | 1 drachm. | 4. |
| | Glycerin | 1 ounce. | 32. |
| | Rose-water | 2 ounces. | 64. |

Mix.

### ERYTHEMA.

| | | | |
|---|---|---|---|
| Take of | Subnitrate of bismuth | 1 drachm. | 4. |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Extract of belladonna leaves | ½ drachm. | 2. |
| | Extract of arnica | 1 scruple. | 1.30 |
| | Sulphate of morphine | 2 grains. | 0.12 |
| | Purified wool-fat | 1 ounce. | 32. |

Mix.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Extract of hyoscyamus | 1 scruple. | 1.30 |
| | Ointment of nitrate of mercury | 3 drachms. | 12. |
| | Oil of spearmint | ½ drachm. | 2. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Lead plaster | 4 ounces. | 128. |
| | Opium plaster | 2 ounces. | 64. |

Mix.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Balsam of Peru | 1 drachm. | 4. |
| | Iodol | 10 grains. | 0.60 |
| | Oxide of lead | ½ drachm. | 2. |
| | Lard | 1 ounce. | 32. |

Mix.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Ergotin | ½ drachm. | 2. |
| | Hydrochloride of cocaine | 5 grains. | 0.30 |
| | Carbonate of lead | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### FURUNCULUS—BOIL.

| | | | |
|---|---|---|---|
| Take of | Menthol | 10 grains. | 0.60 |
| | Hydrochloride of cocaine | 5 grains. | 0.30 |
| | Compound ointment of resin | 1 ounce. | 32. |

Mix.

### HERPES.

| | | | |
|---|---|---|---|
| Take of | Calomel | 3 drachms. | 12. |
| | Subnitrate of bismuth | ½ ounce. | 16. |
| | Powdered lycopodium | ½ ounce. | 16. |

Mix.

### HERPES.

| | | | |
|---|---|---|---|
| Take of | Calomel | 2 drachms. | 8. |
| | Powdered starch | ½ ounce. | 16. |

Mix. Sprinkle on the affected part.

### HERPES.

| | | |
|---|---|---|
| Take of Tannic acid | 15 grains. | 1. |
| Acetate of lead | 20 grains. | 1.30 |
| Sulphate of atropine | 1 grain. | 0.06 |
| Powdered starch | 1 drachm. | 4. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### HERPES.

| | | |
|---|---|---|
| Take of Sulphate of morphine | 3 grains. | 0.18 |
| Prepared calamine | ½ ounce. | 16. |
| Subnitrate of bismuth | ½ ounce. | 16. |

Mix. Dust over the surface.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Hydrochloride of cocaine | 5 grains. | 0.30 |
| Fluidextract of belladonna root | ½ ounce. | 16. |
| Distilled witch-hazel | 1½ ounce. | 48. |

Mix. Mop over the surface frequently, and a fine powder can, at the same time, be dusted on the parts; or collodion can be used in place of the latter.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Salicylate of phenyl | 10 grains. | 0.60 |
| Carbonate of lead | 1 drachm. | 4. |
| Menthol | 15 grains. | 1. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### HERPES ZOSTER—SHINGLES.

| | | |
|---|---|---|
| Take of Powdered oleate of zinc | ½ ounce. | 16. |
| Powdered arrow-root | ½ ounce. | 16. |
| Creosote | 10 minims. | 0.60 |
| Sulphate of morphine | 2 grains. | 0.12 |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | |
|---|---|---|
| Take of Thymol iodide | ½ ounce. | 16. |
| Powdered impure carbonate of zinc | ½ ounce. | 16. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | |
|---|---|---|
| Take of Sulphate of copper | 5 to 10 grains. | 0.30 to 0.60 |
| Distilled witch-hazel water | 5 ounces. | 160. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | |
|---|---|---|
| Take of Tincture of quillaja | 1 ounce. | 32. |
| Hydrochloride of cocaine | 10 to 20 grains. | 0.60 to 1.30 |
| Betanaphthol | 10 to 20 grains. | 0.60 to 1.30 |
| Fluidextract of geranium | 4 ounces. | 128. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | |
|---|---|---|
| Take of Betanaphthol | 1 drachm. | 4. |
| Glycerin | 1½ ounce. | 48. |
| Alcohol | 1½ ounce. | 48. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | | |
|---|---|---|---|
| Take of | Sulphate of quinine | ½ drachm. | 2. |
| | Alcohol | 5 ounces. | 160. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 2 drachms. | 8. |
| | Tincture of saponin | 2 ounces. | 64. |
| | Tincture of witch-hazel | 2 ounces. | 64. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | | |
|---|---|---|---|
| Take of | Permanganate of potassium | 10 grains. | 0.60 |
| | Alcohol | 1 ounce. | 32. |
| | Water | 4 ounces. | 128. |

Mix.

### HYPERIDROSIS—INCREASED SECRETION OF SWEAT.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | ½ ounce. | 16. |
| | Powdered oleate of zinc | 2 drachms. | 8. |

Mix.

### ICHTHYOSIS.

| | | | |
|---|---|---|---|
| Take of | Oil of ergot | 3 ounces. | 96. |
| | Purified wool-fat | 1 ounce. | 32. |

Mix.

### ICHTHYOSIS.

| | | | |
|---|---|---|---|
| Take of | Codliver oil | 6 ounces. | 192. |
| | Oil of eucalyptus | 10 minims. | 0.60 |
| | Creosote | 5 minims. | 0.30 |

Mix.

### IMPETIGO CONTAGIOSA.

| | | | |
|---|---|---|---|
| Take of | Ammoniated mercury | 10 grains. | 0.60 |
| | Thymol | 1 grain. | 0.06 |
| | Carbonate of zinc | 1 drachm. | 4. |
| | Prepared lard | 1 ounce. | 32. |

Mix.

### LENTIGO—FRECKLE.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Distilled witch-hazel | 5 ounces. | 160. |

Mix.

### LENTIGO—FRECKLE.

| | | | |
|---|---|---|---|
| Take of | Corrosive sublimate | 10 grains. | 0.60 |
| | Alcohol | 2 ounces. | 64. |
| | Rose-water | 2 ounces. | 64. |

Mix.

### LENTIGO—FRECKLE.

| | | | |
|---|---|---|---|
| Take of | Oleate of copper | 10 grains. | 0.60 |
| | Hydrastinine hydrochloride | 2 grains. | 0.12 |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### LENTIGO—FRECKLE.

| | | | |
|---|---|---|---|
| Take of | Lactic acid | ½ ounce. | 16. |
| | Glycerin | ½ ounce. | 16. |
| | Rose-water | ½ ounce. | 16. |

Mix. Useful also in other pigmentations of the skin.

### LENTIGO—FRECKLE.

| | | |
|---|---|---|
| Take of Boric acid | 1 drachm. | 4. |
| Hydrochloride of cocaine | 5 grains. | 0.30 |
| Cologne-water | 2 ounces. | 64. |

Mix.

### LENTIGO—FRECKLE.

| | | |
|---|---|---|
| Take of Corrosive sublimate | 10 grains. | 0.60 |
| Tincture of bezoin | ½ ounce. | 16. |
| Glycerin | 1 ounce. | 32. |
| Rose-water | 5 ounces. | 160. |

Mix.

### LUPUS ERYTHEMATOSUS.

| | | |
|---|---|---|
| Take of Creosote | 8 minims. | 0.50 |
| Subnitrate of bismuth | 1 drachm. | 4. |
| Purified wool-fat | 4 drachms. | 16. |
| Ointment of rose-water | 4 drachms. | 16. |

Mix.

### LUPUS ERYTHEMATOSUS.

| | | |
|---|---|---|
| Take of Tincture of green soap | 3 ounces. | 96. |
| Distilled witch-hazel | 2 ounces. | 64. |

Mix. Sponge over the surface every day or two.

### LUPUS ERYTHEMATOSUS.

| | | |
|---|---|---|
| Take of Yellow oxide of mercury | 10 grains. | 0.60 |
| Salicylate of phenyl | 10 grains. | 0.60 |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### LUPUS ERYTHEMATOSUS.

| | | |
|---|---|---|
| Take of Europhen | 1 drachm. | 4. |
| Hydrous wool-fat | ½ ounce. | 16. |
| Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### LUPUS VULGARIS.

| | | |
|---|---|---|
| Take of Hydrochloride of cocaine | 20 grains. | 1.30 |
| Phenol | 2 drachms. | 8. |
| Alcohol | 1 ounce. | 32. |

Mix. Apply over the surface with cotton, or a camel's-hair brush, every other y. Use, after employing this solution, a soothing ointment to the diseased skin.

### LUPUS VULGARIS.

| | | |
|---|---|---|
| Take of Iodol | ½ drachm. | 2. |
| Betanaphthol | 15 grains. | 1. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### LUPUS VULGARIS.

| | | |
|---|---|---|
| Take of Corrosive sublimate | 5 grains. | 0.30 |
| Powdered arrow-root | 1 drachm. | 4. |
| Subnitrate of bismuth | 1 drachm. | 4. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### LUPUS VULGARIS.

| | | |
|---|---|---|
| Take of Creosote | 5 minims. | 0.30 |
| Salicylic acid | 15 grains. | 1. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### MILIARIA—PRICKLY HEAT.

| | | |
|---|---|---|
| Take of Calomel | 10 grains. | 0.60 |
| Powdered arrow-root | 1 drachm. | 4. |
| Carbonate of lead | 2 drachms. | 8. |
| Lard | 1 ounce. | 32. |

Mix.

### MILIARIA—PRICKLY HEAT.

| | | |
|---|---|---|
| Take of Lime-water | 3 ounces. | 96. |
| Levigated calamine | ½ ounce. | 16. |
| Glycerin | 2 ounces. | 64. |

Mix.

### MILIARIA—PRICKLY HEAT.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 30 grains. | 2. |
| Camphor | 10 grains. | 0.60 |
| Carbonate of zinc | ½ ounce. | 16. |
| Powdered arrow-root | ½ ounce. | 16. |

Mix.

### MILIARIA—PRICKLY HEAT.

| | | |
|---|---|---|
| Take of Creosote | 5 minims. | 0.30 |
| Subnitrate of bismuth | ½ ounce. | 16. |
| Distilled witch-hazel water | 4 ounces. | 128. |

Mix.

### MILIUM—ACNE ALBIDA.

| | | |
|---|---|---|
| Take of Tincture of iodine | 2 drachms. | 8. |
| Phenol | ½ drachm. | 2. |

Mix. Touch each spot every second or third day, exercising care to avoid the natural skin.

### MILIUM—ACNE ALBIDA.

| | | |
|---|---|---|
| Take of Liniment of camphor | 1 ounce. | 32. |
| Tincture of green soap | 2 ounces. | 64. |

Mix.

### NEVUS VASCULARIS.

| | | |
|---|---|---|
| Take of Solution of subacetate of lead | 2 ounces. | 64. |

Apply once or twice a day for some months.

### NEVUS VASCULARIS.

| | | |
|---|---|---|
| Take of Solution of arsenite of potassium | 1 ounce. | 32. |

Paint over the surface several times a day.

### NEVUS VASCULARIS.

| | | |
|---|---|---|
| Take of Flexible collodion | 1 ounce. | 32. |

Paint over the lesion once a day.

### PARESTHESIA OR PRURITUS.

| | | |
|---|---|---|
| Take of Creosote | 10 to 20 minims. | 0.60 to 1.30 |
| Oil of peppermint | 10 to 20 minims. | 0.60 to 1.30 |
| Glycerin | 5 ounces. | 160. |

Mix.

### PARESTHESIA OR PRURITUS.

Take of Phenol .......................... 5 to
Menthol .................. ...... 10 to
Ointment of oxide of zinc................
Mix.

### PARESTHESIA, OR PRURITUS ANI—ITCHING O

Take of Hydrate of chloral......................
Camphor ..............................
Prepared suet .........................
Mix.

### PARESTHESIA, OR PRURITUS ANI—ITCHING C

Take of Betanaphthol ..........................
Subnitrate of bismuth....................
Ointment of oxide of zinc................
Mix.

### PARESTHESIA, OR PRURITUS ANI—ITCHING C

Take of Thymol iodide .........................
Monobromated camphor ..................
Lupulin ..............................
Oil of theobroma.......................
Mix and divide into twenty suppositories.
Insert one into the rectum whenever troubled with i

### PARESTHESIA, OR PRURITUS LABIORUM—ITCHIN

Take of Boric acid ............................
Thymol iodide .................. 10 to
Camphor ..............................
Carbonate of zinc......................
Creosote ..............................
Ointment of oxide of zinc...............
Mix.

### PARESTHESIA, OR PRURITUS LABIORUM—ITCHIN

Take of Borate of sodium........................
Camphor ..............................
Carbonate of lead.......................
Phenol (liquid) ............ .........
Ointment of oxide of zinc...............
Mix.

### PARESTHESIA, OR PRURITUS LABIORUM—ITCHIN

Take of Extract of belladonna leaves.............
Extract of opium.......................
Tannic acid ...........................
Oil of theobroma, a sufficient quantity.
Mix and divide into twelve suppositories.
Insert one in the vagina every two or three hours un

### PARESTHESIA, OR PRURITUS VAGINÆ—ITCHING

Take of Hydrochloride of cocaine................
Phenol ......................... 5 to
Lime-water ............................
Distilled witch-hazel water...............
Mix. Apply within the vagina by means of absor injection.

### PARESTHESIA, OR PRURITUS VAGINÆ—ITCHING OF THE VAGINA.

| | | | |
|---|---|---|---|
| Take of | Alum | 1 ounce. | 32. |
| | Borate of sodium | 1 ounce. | 32. |

Mix. Add to one quart of hot water, and inject into the vagina.

### PARESTHESIA, OR PRURITUS VAGINÆ—ITCHING OF THE VAGINA.

| | | | |
|---|---|---|---|
| Take of | Thiosulphati of sodium | 6 drachms. | 24. |

Add to one pint of hot water and at once inject into the vagina, and apply hot as can be borne to surface of external genitals.

### PARESTHESIA, OR PRURITUS SCROTI—ITCHING OF THE SCROTUM.

| | | | |
|---|---|---|---|
| Take of | Extract of stramonium leaves | 8 grains. | 0.50 |
| | Camphor | 1 drachm. | 4. |
| | Benzoinated lard | 1 ounce. | 32. |

Mix.

### PARESTHESIA, OR PRURITUS SCROTI—ITCHING OF THE SCROTUM.

| | | | |
|---|---|---|---|
| Take of | Codliver oil | 3 ounces. | 96. |
| | Extract of witch-hazel | 3 drachms. | 12. |
| | Chaulmoogra oil | 3 ounces. | 96. |

Mix.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Creolin | ½ to 1 drachm. | 2. to 4. |
| | Lard or ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | 1 drachm. | 4. |
| | Cologne-water | 4 to 6 ounces. | 128. to 192. |

Mix.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | 1 drachm. | 4. |
| | Stavesacre ointment | 1 ounce. | 32. |

Mix.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Fluidextract of delphinium | 1 ounce. | 32. |
| | Water | 4 ounces. | 128. |

Mix. Apply with a sponge, after brushing the hair.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | 1 ounce. | 32. |
| | Chlorinated oil | 1 ounce. | 32. |

Mix.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Betanaphthol | ½ drachm. | 2. |
| | Lard | 1 ounce. | 32. |

Mix.

### PEDICULOSIS—LOUSINESS.

| | | | |
|---|---|---|---|
| Take of | Oil of sassafras | 2 ounces. | 64. |

Dip the ends of the bristles into the oil poured out into a saucer, and brush the hair; and also apply to the scalp. Cover the hair with a bandage or cap over night, and wash scalp with soap in the morning.

### PEMPHIGUS.

| | | | |
|---|---|---|---|
| Take of | Powdered red cinchona | ½ ounce. | 16. |
| | Carbonate of lead | 2 drachms. | 8. |
| | Subnitrate of bismuth | 2 drachms. | 8. |

Mix.

### PEMPHIGUS.

| | | | |
|---|---|---|---|
| Take of | Prepared calamine | ½ ounce. | 16. |
| | Glycerin | 2 ounces. | 64. |
| | Lime-water | 4 ounces. | 128. |

Mix.

### PEMPHIGUS.

| | | | |
|---|---|---|---|
| Take of | Subnitrate of bismuth | 2 drachms. | 8. |
| | Powdered starch | 4 drachms. | 16. |
| | Ointment of benzoinated oxide of zinc | 1 ounce. | 32. |

Mix.

### PEMPHIGUS.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide | ½ drachm. | 2. |
| | Creolin | 10 to 20 minims. | 0.60 to 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### PEMPHIGUS.

| | | | |
|---|---|---|---|
| Take of | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Subnitrate of bismuth | 2 drachms. | 8. |
| | Phenol | 5 to 10 grains. | 0.30 to 0.60 |
| | Powdered arrow-root | 1 drachm. | 4. |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### PITYRIASIS RUBRA.

| | | | |
|---|---|---|---|
| Take of | Creolin | 10 to 30 minims. | 0.60 to 2. |
| | Lime-water | 4 ounces. | 128. |
| | Olive oil, or glycerin | 4 ounces. | 128. |

Mix.

### PITYRIASIS RUBRA.

| | | | |
|---|---|---|---|
| Take of | Olive oil | 4 ounces. | 128. |
| | Creosote | 5 minims. | 0.30 |
| | Oil of ergot | 2 ounces. | 64. |

Mix.

### PRURIGO.

| | | | |
|---|---|---|---|
| Take of | Menthol | 1 drachm. | 4. |
| | Olive oil | 5 ounces. | 160. |

Mix.

### PRURIGO.

| | | | |
|---|---|---|---|
| Take of | Sublimed sulphur | ½ drachm. | 2. |
| | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Phenol | 5 to 10 grains. | 0.30 to 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### PSORIASIS.

| | | | |
|---|---|---|---|
| Take of | Oil of juniper | 1 drachm. | 4. |
| | Ointment of nitrate of mercury | ½ ounce. | 16. |
| | Ointment of turpentine | ½ ounce. | 16. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Anthrarobin | 1 drachm. | 4. |
| Ointment of nitrate of mercury | ½ ounce. | 16. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Salicylic acid | 1 drachm. | 4. |
| Oil of cade | 1 drachm. | 4. |
| Balsam of Peru | 2 drachms. | 8. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Thymol iodide | 1 to 2 drachms. | 4. to 8. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Ointment of oleate of mercury | 1 ounce. | 32. |
| Oil of cade | 1 drachm. | 4. |
| Betanaphthol | 1 drachm. | 4. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Ointment of nitrate of mercury | 1 ounce. | 32. |
| Iodol | 1 drachm. | 4. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Chrysarobin | 1 drachm. | 4. |
| Benzoinated lard | 1 ounce. | 32. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Oil of turpentine | 1 ounce. | 32. |
| Purified wool-fat | 1 ounce. | 32. |

Mix.

### PSORIASIS.

| | | |
|---|---|---|
| Take of Green soap (soft soap) | 1 ounce. | 32. |
| Ointment of ammoniated mercury | 1 ounce. | 32. |

Mix.

### PURPURA.

| | | |
|---|---|---|
| Take of Alum | ½ ounce. | 16. |
| Alcohol | 6 ounces. | 192. |

Mix.

### PURPURA.

| | | |
|---|---|---|
| Take of Tannic acid | ½ drachm. | 2. |
| Camphor | 1 drachm. | 4. |
| Benzoinated lard | 1 ounce. | 32. |

Mix.

### PURPURA.

| | | |
|---|---|---|
| Take of Spirit of lavender | ½ ounce. | 16. |
| Spirit of rosemary | ½ ounce. | 16. |
| Tincture of witch-hazel | 3 ounces. | 96. |
| Water | 2 ounces. | 64. |

Mix.

### PURPURA.

| | | |
|---|---|---|
| Take of Tincture of capsicum | ½ ounce. | 16. |
| Spirit of myrcia (bay-rum) | 3½ ounces. | 112. |

Mix.

### PURPURA.

| | | |
|---|---|---|
| Take of Calomel | 10 grains. | 0.60 |
| Betanaphthol | 10 grains. | 0.60 |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### PURPURA.

| | | |
|---|---|---|
| Take of Oil of cade | 1 drachm. | 4. |
| Sublimed sulphur | ½ drachm. | 2. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Ergotin | ½ drachm. | 2. |
| Ointment of subacetate of lead | 1 ounce. | 32. |

Mix.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Anthrarobin | ½ to 1 drachm. | 2. to 4. |
| Creolin | 5 to 10 minims. | 0.30 to 0.60 |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Hydrochloride of hydrastinine | 1 grain. | 0.06 |
| Tincture of witch-hazel | 2 drachms. | 8. |
| Rose-water | 2 ounces. | 64. |

Mix. Apply twice daily.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Tannic acid | 10 grains. | 0.60 |
| Sublimed sulphur | ½ drachm. | 2. |
| Carbonate of zinc | 1 drachm. | 4. |
| Lard | 1 ounce. | 32. |

Mix.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Ergotin | 1 scruple. | 1.30 |
| Purified wool-fat | 3 drachms. | 12. |

Mix.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Extract of witch-hazel | 10 grains. | 0.60 |
| Ointment of lead oleate | 3 drachms. | 12. |

Mix.

### ROSACEA—ACNE ROSACEA.

| | | |
|---|---|---|
| Take of Ointment of bismuth oleate | 2 drachms. | 8. |
| Oil of juniper | 5 minims. | 0.30 |

Mix.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Cucumber ointment | 2 ounces. | 64. |
| Powdered starch | 2 drachms. | 8. |
| Ointment of rose-water | 2 ounces. | 64. |

Mix.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Camphor | ½ drachm. | 2. |
| Oil of theobroma | 1 ounce. | 32. |

Mix.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Codliver oil | 6 ounces. | 192. |
| Creosote | 8 minims. | 0.50 |

Mix.

### RUBEOLA—MEASLES.

| | | |
|---|---|---|
| Take of Menthol | 1 scruple. | 1.30 |
| Olive oil | 6 ounces. | 192. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Betanaphthol | ½ drachm. | 2. |
| Purified wool-fat | ½ ounce. | 16. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Chlorinated oil | 2 ounces. | 64. |

(Prepared by passing chlorine-gas in olive oil).

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Betanaphthol | ½ drachm. | 2. |
| Sublimed sulphur | 1 drachm. | 4. |
| Ointment of oleate of mercury | ½ ounce. | 16. |
| Simple ointment | ½ ounce. | 16. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Oil of cade | 3 drachms. | 12. |
| Sublimed sulphur | 4 drachms. | 16. |
| Green (soft) soap | 1 ounce. | 32. |
| Lard | 2 ounces. | 64. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Red oxide of mercury | ½ drachm. | 2. |
| Balsam of Peru | ½ ounce. | 16. |
| Lard | 3 ounces. | 96. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Betanaphthol | 20 grains. | 1.30 |
| Ointment of stavesacre | 1 ounce. | 32. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Iodol | ½ to 1 drachm. | 2. to 4. |
| Sublimed sulphur | 1 drachm. | 4. |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### SCABIES—ITCH.

| | | |
|---|---|---|
| Take of Sublimed sulphur | 1 drachm. | 4. |
| Storax | 10 to 30 grains. | 0.60 to 2. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SCARLATINA—SCARLET FEVER.

| | | | |
|---|---|---|---|
| Take of | Oil of eucalyptus | 5 minims. | 0.30 |
| | Prepared lard | 1 ounce. | 32. |

Mix.

### SCARLATINA—SCARLET FEVER.

| | | | |
|---|---|---|---|
| Take of | Borax | ½ drachm. | 2. |
| | Powdered starch | 1 drachm. | 4. |
| | Lard | 1 ounce. | 32. |

Mix.

### SCARLATINA—SCARLET FEVER.

| | | | |
|---|---|---|---|
| Take of | Prepared suet | 1 ounce. | 32. |
| | Camphor | 5 grains. | 0.30 |
| | Ointment of rose-water | 1 ounce. | 32. |

Mix.

### SCARLATINA—SCARLET FEVER.

| | | | |
|---|---|---|---|
| Take of | Menthol | 10 grains. | 0.60 |
| | Phenol | 5 grains. | 0.30 |
| | Lime-water | 4 ounces. | 128. |
| | Olive oil | 4 ounces. | 128. |

Mix.

### SCROFULODERMA.

| | | | |
|---|---|---|---|
| Take of | Iodosulphate of cinchonine | ½ drachm. | 2. |
| | Powdered oleate of zinc | ½ drachm. | 2. |
| | Powdered starch | 1 drachm. | 4. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SCROFULODERMA.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide | ½ to 1 drachm. | 2. to 4. |
| | Calomel | 10 to 20 grains. | 0.60 to 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SCROFULODERMA.

| | | | |
|---|---|---|---|
| Take of | Iodoform | 24 grains. | 1.50 |
| | Oleic acid | 1 ounce. | 32. |

Mix.

### SCROFULODERMA.

| | | | |
|---|---|---|---|
| Take of | Iodol | ½ drachm. | 2. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SCROFULODERMA.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | ½ ounce. | 16. |
| | Subiodide of bismuth | 1 scruple. | 1.30 |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 2 drachms. | 8. |
| | Orange-flower water | 2 ounces. | 64. |
| | Rose-water | 2 ounces. | 64. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Chloride of zinc | 5 grains. | 0.30 |
| Rose-water | 4 ounces. | 128. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Corrosive sublimate | 10 grains. | 0.60 |
| Tincture of witch-hazel | ½ ounce. | 16. |
| Rose-water | 4½ ounces. | 144. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Oleate of zinc | 2 drachms. | 8. |
| Powdered arrow-root | ½ ounce. | 16. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Hydrochloride of cocaine | 5 to 10 grains. | 0.30 to 0.60 |
| Hydrochloride of hydrastinine | 3 grains. | 0.18 |
| Rose-water | 4 ounces. | 128. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Salicylic acid | 2 drachms. | 8. |
| Subnitrate of bismuth | 1 ounce. | 32. |
| Powdered oleate of zinc | 3 drachms. | 12. |

Mix.

### SEBORRHEA OLEOSA—OILY SEBORRHEA.

| | | |
|---|---|---|
| Take of Creolin | 5 to 10 minims. | 0.30 to 0.60 |
| Carbonate of zinc | 2 drachms. | 8. |
| Oil of eucalyptus | 5 minims. | 0.30 |
| Ointment of rose-water | 1 ounce. | 32. |

Mix.

### SEBORRHEA GENITALIUM—SEBORRHEA OF THE GENITAL ORGANS.

| | | |
|---|---|---|
| Take of Boric acid | 1 drachm. | 4. |
| Phenol | 5 grains. | 0.30 |
| Distilled witch-hazel | 4 ounces. | 128. |

Mix.

### SEBORRHEA GENITALIUM—SEBORRHEA OF THE GENITALS.

| | | |
|---|---|---|
| Take of Subnitrate of bismuth | 1 drachm. | 4. |
| Carbonate of lead | 1 drachm. | 4. |
| Glycerin | 2 ounces. | 64. |
| Lime-water | 2 ounces. | 64. |

Mix.

### SEBORRHEA GENITALIUM—SEBORRHEA OF THE GENITALS.

| | | |
|---|---|---|
| Take of Powdered oleate of zinc | 2 drachms. | 8. |
| Calomel | 1 scruple. | 1.30 |
| Powdered starch | ½ ounce. | 16. |

Mix.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | |
|---|---|---|
| Take of Oil of ergot | 3 ounces. | 96. |
| Oil of rose | 2 minims. | 0.12 |

Mix. Apply twice a day. Especially serviceable in seborrhea of the scalp or dandruff.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | | |
|---|---|---|---|
| Take of | Tincture of saponaria | 2 ounces. | 64. |
| | Fluid petrolatum | 2 ounces. | 64. |

Mix. Useful in seborrhea or dandruff of scalp.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | | |
|---|---|---|---|
| Take of | Fifty-per-cent. solution of boroglycerin | 3½ ounces. | 112. |
| | Oleic acid | ½ ounce. | 16. |
| | Phenol | 3 grains. | 0.18 |

Mix. Good in seborrhea of face, back, and chest.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | | |
|---|---|---|---|
| Take of | Tannic acid | 1 drachm. | 4. |
| | Glycerin | 1 ounce. | 32. |
| | Balsam of Peru | 1 drachm. | 4. |
| | Oil of rose | 5 minims. | 0.30 |
| | Purified wool-fat | 1 ounce. | 32. |

Mix.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | | |
|---|---|---|---|
| Take of | Borax | 1 drachm. | 4. |
| | Creolin | 10 to 20 minims. | 0.60 to 1.30 |
| | Codliver oil | 4 ounces. | 128. |

Mix.

### SEBORRHEA SICCA—DRY OR SCALY SEBORRHEA.

| | | | |
|---|---|---|---|
| Take of | Calomel | 10 grains. | 0.60 |
| | Balsam of Peru | ½ drachm. | 2. |
| | Powdered camphor | 1 scruple. | 1.30 |
| | Ointment of rose-water | 1 ounce | 32. |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Oil of cade | 30 minims. | 2. |
| | Extract of ergot | 1 scruple. | 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES.

| | | | |
|---|---|---|---|
| Take of | Solution of subacetate of lead | 3 ounces. | 96. |
| | Glycerin | 3 ounces. | 96. |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES.

| | | | |
|---|---|---|---|
| Take of | Sulphate of copper | 10 to 30 grains. | 0.60 to 2. |
| | Boric acid | 1 drachm. | 4. |
| | Creosote | 10 minims. | 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES.

| | | | |
|---|---|---|---|
| Take of | Powdered poke-root | 1 drachm. | 4. |
| | Menthol | 10 grains. | 0.60 |
| | Purified wool-fat | ½ ounce. | 16. |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES.

| | | | |
|---|---|---|---|
| Take of | Ointment of bismuth oleate | 3 drachms. | 12. |
| | Nut gall | 5 grains. | 0.30 |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES, CHRONIC.

| | | | |
|---|---|---|---|
| Take of | Phenol | 4 grains. | 0.24 |
| | Glycerin | 6 ounces. | 192. |

Mix.

### SYCOSIS—INFLAMMATION OF THE HAIR-FOLLICLES, CHRONIC.

| | | | |
|---|---|---|---|
| Take of | Ointment of mercury oleate | 1 ounce. | 32. |
| | Oil of juniper | ½ drachm. | 2. |

Mix.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Powdered red cinchona-bark | 2 drachms. | 8. |
| | Subnitrate of bismuth | 4 drachms. | 16. |
| | Iodol | 3 drachms. | 12. |

Mix. Use in syphilitic ulceration.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Corrosive sublimate | 4 grains. | 0.24 |
| | Purified wool-fat | 5 drachms. | 20. |

Mix.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Extract of belladonna leaves | 10 grains. | 0.60 |
| | Ointment of oleate of mercury | 3 drachms. | 12. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Chromic acid | 8 grains. | 0.50 |
| | Water | 1 ounce. | 32. |

Mix. Valuable in involvement of mucous surfaces.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Chloride of zinc | 10 grains. | 0.60 |
| | Water | 1 ounce. | 32. |

Mix. Also for application on mucous surfaces.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of iron | ½ ounce. | 16. |
| | Salicylic acid | 5 grains. | 0.30 |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Iodol | 1 drachm. | 4. |
| | Subnitrate of bismuth | 3 drachms. | 12. |

Mix. Use in syphilitic ulceration.

### SYPHILIS.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | ½ ounce. | 16. |
| | Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Ointment of nitrate of mercury | ½ ounce. | 16. |
| Oil of cade | ½ drachm. | 2. |
| Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Iodosulphate of cinchonine | 1 drachm. | 4. |
| Oil of chamomile | 10 minims. | 0.60 |
| Purified wool-fat | ½ ounce. | 16. |
| Ointment of oxide of zinc | ½ ounce. | 16. |

Mix.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Iodoform | 1 drachm. | 4. |
| Camphor | 10 to 20 grains. | 0.60 to 1.30 |
| Powdered starch | 2 ounces. | 64. |

Mix. Use especially upon an ulcerated surface.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Thymol iodide | 1 drachm. | 4. |
| Creosote | 10 minims. | 0.60 |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Green (soft) soap | 1 ounce. | 32. |
| Ointment of nitrate of mercury | 1 ounce. | 32. |
| Oil of eucalyptus | ½ drachm. | 2. |

Mix. For old syphilitic patches.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Ointment of oleate of mercury (10 per cent.) | 1 ounce. | 32. |
| Oil of cade | 2 drachms. | 8. |
| Oil of cloves | 10 to 20 minims. | 0.60 to 1.30 |

Mix.

### SYPHILIS.

| | | |
|---|---|---|
| Take of Calomel | 10 to 20 grains. | 0.60 to 1.30 |
| Carbonate of zinc | 1 drachm. | 4. |
| Creolin | 5 to 10 minims. | 0.30 to 0.60 |
| Powdered arrow-root | 1 drachm. | 4. |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix. Serviceable especially in infantile syphilis.

### TINEA BARBÆ—BARBER'S ITCH.

| | | |
|---|---|---|
| Take of Oleate of copper | 1 scruple. | 1.30 |
| Oil of chamomile | 5 minims. | 0.30 |
| Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### TINEA BARBÆ—BARBER'S ITCH.

| | | |
|---|---|---|
| Take of Europhen | ½ to 1 drachm. | 2. to 4. |
| Ointment of oleate of mercury (ten to twenty per cent.) | 1 ounce. | 32. |
| Oil of eucalyptus | 10 minims. | 0.60 |

Mix.

### TINEA BARBÆ—BARBER'S ITCH.

| | | | |
|---|---|---|---|
| Take of | Solution of boroglycerin (fifty per cent.) | 4 ounces. | 128. |
| | Carbonate of zinc | ½ ounce. | 16. |
| | Creosote | 10 minims. | 0.60 |

Mix.

### TINEA BARBÆ—BARBER'S ITCH.

| | | | |
|---|---|---|---|
| Take of | Corrosive sublimate | 8 grains. | 0.50 |
| | Alcohol | 1 ounce. | 32. |
| | Distilled witch-hazel | 3 ounces | 96. |

Mix.

### TINEA CIRCINATA—RINGWORM OF THE BODY.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | ½ ounce. | 16. |
| | Oil of cade | 20 minims. | 1.30 |

Mix.

### TINEA CIRCINATA—RINGWORM OF THE BODY.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Thymol | 5 minims. | 0.30 |
| | Alcohol | 4 ounces. | 128. |

Mix.

### TINEA CIRCINATA—RINGWORM OF THE BODY.

| | | | |
|---|---|---|---|
| Take of | White precipitate | 10 to 30 grains. | 0.60 to 2. |
| | Betanaphthol | 10 grains. | 0.60 |
| | Phenol | 5 to 10 grains. | 0.30 to 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### TINEA CIRCINATA—RINGWORM OF THE BODY.

| | | | |
|---|---|---|---|
| Take of | Resorcinol | ½ drachm. | 2. |
| | Subnitrate of bismuth | ½ drachm. | 2. |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### TINEA FAVOSA—FAVUS.

| | | | |
|---|---|---|---|
| Take of | Oleate of copper | 1 scruple. | 1.30 |
| | Salicylic acid | 5 grains. | 0.30 |
| | Calomel | 10 grains. | 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### TINEA FAVOSA—FAVUS.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Alcohol | 2 ounces. | 64. |
| | Sulphuric ether | 2 ounces. | 64. |

Mix.

### TINEA FAVOSA—FAVUS.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury (twenty per cent.) | 1 ounce. | 32. |
| | Thymol iodide | ½ to 1 drachm. | 2. to 4. |

Mix.

### TINEA FAVOSA—FAVUS.

| | | | |
|---|---|---|---|
| Take of | Calomel | | |
| | Betanaphthol | | |
| | Ointment of oxide of zinc. | | |

Mix.

### TINEA TONSURANS—RINGWORM OF THE SCALP.

| | | | |
|---|---|---|---|
| Take of | Corrosive sublimate | 10 to 15 grains. | 0.60 to 1. |
| | Spirit of thymol | 1 drachm. | 4. |
| | Cologne-water | 5 ounces. | 160. |

Mix.

### TINEA TONSURANS—RINGWORM OF THE SCALP.

| | | | |
|---|---|---|---|
| Take of | Boric acid | 1 drachm. | 4. |
| | Creolin | 10 to 30 minims. | 0.60 to 2. |
| | Olive oil | 6 ounces. | 192. |

Mix.

### TINEA TONSURANS—RINGWORM OF THE SCALP.

| | | | |
|---|---|---|---|
| Take of | Oleate of copper | ½ drachm. | 2. |
| | Creosote | 5 minims. | 0.30 |
| | Lard | 1 ounce. | 32. |

Mix.

### TINEA TONSURANS—RINGWORM OF THE SCALP.

| | | | |
|---|---|---|---|
| Take of | Oleic acid | 1 ounce. | 32. |
| | Iodol | ½ drachm. | 2. |

Mix.

### TINEA VERSICOLOR—CHROMOPHYTOSIS.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of copper | 2 drachms. | 8. |
| | Purified wool-fat | 2 drachms. | 8. |

Mix.

### TINEA VERSICOLOR—CHROMOPHYTOSIS.

| | | | |
|---|---|---|---|
| Take of | Resorcinol | 10 grains. | 0.60 |
| | Lard | 1 ounce. | 32. |

Mix.

### TINEA VERSICOLOR—CHROMOPHYTOSIS.

| | | | |
|---|---|---|---|
| Take of | Anthrarobin | 1 drachm. | 4. |
| | Oil of eucalyptus | 10 minims. | 0.60 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### TINEA VERSICOLOR—CHROMOPHYTOSIS.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury (ten per cent.) | 1 ounce. | 32. |
| | Betanaphthol | 10 to 30 grains. | 0.60 to 2. |

Mix.

### TUBERCULOSIS CUTIS—TUBERCULOSIS OF THE SKIN.

| | | | |
|---|---|---|---|
| Take of | Creosote | 1 drachm. | 4. |
| | Compound tincture of benzoin | 2 drachms. | 8. |
| | Distilled witch-hazel | 2 ounces. | 64. |
| | Glycerin | 3 ounces. | 96. |

Mix. Use in an atomizer. Spray over the surface several times a day.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Chlorate of potassium | 2 drachms. | 8. |
| | Extract of ergot | 1½ ounce. | 48. |
| | Glycerin | 1½ ounce. | 48. |

Mix. Useful in ulceration of the mucous membrane.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Iodol | 1 scruple. | 1.30 |
| | Ointment of oxide of zinc | 1 ounce. | 32. |

Mix.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Powdered red cinchona | 3 drachms. | 12. |
| | Subnitrate of bismuth | 3 drachms. | 12. |

Mix.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Tincture of witch-hazel | ½ ounce. | 16. |
| | Hydrate of chloral | 1 drachm. | 4. |
| | Water | 3½ ounces. | 112. |

Mix. Apply with old muslin, or lint. Useful in indolent ulcers.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Subiodide of bismuth | ½ ounce. | 16. |
| | Powdered calamine | ½ ounce. | 16. |

Mix.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Calomel | ½ ounce. | 16. |
| | Iodoform or iodol | ½ ounce. | 16. |

Mix. Sprinkle over the ulcer.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Extract of conium | ½ drachm. | 2. |
| | Extract of belladonna leaves | ½ drachm. | 2. |
| | Ointment of tobacco | 1 ounce. | 32. |

Mix.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Subiodide of bismuth | 1 drachm. | 4. |
| | Powdered red cinchona-bark | 1 ounce. | 32. |

Mix.

### ULCERA—ULCERS.

| | | | |
|---|---|---|---|
| Take of | Iodosulphate of cinchonine | 1 drachm. | 4. |
| | Carbonate of zinc | 2 drachms. | 8. |
| | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Purified wool-fat, or prepared suet | ½ ounce. | 16. |
| | Ointment of rose-water | ½ ounce. | 16. |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | | |
|---|---|---|---|
| Take of | Menthol | 10 grains. | 0.60 |
| | Hydrochloride of cocaine | 10 grains. | 0.60 |
| | Subnitrate of bismuth | 2 drachms. | 8. |
| | Purified wool-fat | ½ ounce. | 16. |
| | Ointment of rose-water | ½ ounce. | 16. |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | | |
|---|---|---|---|
| Take of | Chloroform | | |
| | Tincture of opium | | |
| | Tincture of aconite | | |
| | Soap liniment | | |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | |
|---|---|---|
| Take of Creolin | 5 to 20 minims. | 0.30 to 1.30 |
| Lime-water | 3 ounces. | 96. |
| Glycerin, or olive oil | 3 ounces. | 96. |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | |
|---|---|---|
| Take of Phenol | 1 drachm. | 4. |
| Alcohol | 4 ounces. | 128. |
| Water | 1 pint. | 512. |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | |
|---|---|---|
| Take of Menthol | 1 drachm. | 4. |
| Olive oil | 4 ounces. | 128. |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | |
|---|---|---|
| Take of Creosote | 10 minims. | 0.60 |
| Water | ½ pint. | 256. |

Mix.

### URTICARIA—NETTLE-RASH—HIVES.

| | | |
|---|---|---|
| Take of Boric acid | 2 drachms. | 8. |
| Cologne-water | 4 ounces. | 128. |
| Glycerin | 2 ounces. | 64. |
| Rose-water | 2 ounces. | 64. |

Mix.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Iodol | 1 drachm. | 4. |
| Salicylate of sodium | 2 drachms. | 8. |
| Precipitated carbonate of lime | 2 ounces. | 64. |

Mix. Sprinkle over the surface.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Prepared chalk | 6 drachms. | 24. |
| Boric acid | 1 drachm. | 4. |
| Oil of wintergreen | 40 minims. | 2.60 |
| Subnitrate of bismuth | 3 drachms. | 12. |
| Olive oil | 6 ounces. | 192. |

Mix.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Phenol | 5 grains. | 0.30 |
| Prepared chalk | ½ ounce. | 16. |
| Subnitrate of bismuth | 3 drachms. | 12. |
| Ointment of rose-water | 1½ ounce. | 48. |

Mix.

### VARIOLA—SMALL-POX.

| | | |
|---|---|---|
| Take of Creolin | 10 to 30 minims. | 0.60 to 2. |
| Bicarbonate of sodium | ½ ounce. | 16. |
| Powdered impure carbonate of zinc | 4 ounces. | 128. |
| Glycerin, or olive oil, sufficient quantity to make into a paste. | | |

Mix. Apply over the eruption with old muslin.

### VARIOLA—SMALL-POX.

| | | | |
|---|---|---|---|
| Take of | Thymol iodide, or Europhen | ½ ounce. | 16. |
| | Prepared chalk | 4 ounces. | 128. |
| | Glycerin or olive oil, sufficient quantity to make into a paste. | | |

Mix. Employ upon the eruption by means of lint.

### VERRUCA—WART.

| | | | |
|---|---|---|---|
| Take of | Salicylate of phenyl | 1 drachm. | 4. |
| | Collodion | 4 drachms. | 16. |
| | Sulphuric ether | 2 ounces | 64. |

Mix.

### VERRUCA—WART.

| | | | |
|---|---|---|---|
| Take of | Resorcinol | 1 to 2 drachms. | 4. to 8. |
| | Traumaticin | 1 ounce. | 32. |

Mix.

### VERRUCA—WART.

| | | | |
|---|---|---|---|
| Take of | Ointment of oleate of mercury | ½ ounce. | 16. |
| | Purified wool-fat | ½ ounce. | 16. |

Mix.

### VERRUCA—WART.

| | | | |
|---|---|---|---|
| Take of | Salicylic acid | 1 drachm. | 4. |
| | Collodion | 3 drachms. | 12. |
| | Sulphuric ether | 2 ounces. | 64. |

Mix.

## MEDICINAL PLASTERS.

### ALUM, ERGOT, HEMLOCK, AND WHITE PRECIPITATE.

| | |
|---|---|
| Alum | 20 per cent. |
| Extract of ergot | 20 " |
| Extract of hemlock-bark | 20 " |
| White precipitate | 30 " |
| Plaster mass[1] | 10 " |

A satisfactory combination for cancerous affections, pustular and tubercular growths, lupus, scrofulous patches, hyperidrosis, and bromidrosis.

### ANTHRAROBIN.

| | |
|---|---|
| Anthrarobin | 25 per cent. |
| Plaster mass[1] | 75 " |

For chronic eczema, psoriasis, acne, rosacea, old syphilitic and scrofulous patches, and old ulcers.

### ANTIMONY.

| | |
|---|---|
| Antimony | 10 per cent. |
| Plaster mass | 90 " |

Useful in chloasma, keloid, scars, and indurated spots of eczema and acne.

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[1] The plaster mass is composed of fifty parts of India rubber, five parts of honey, and forty-five parts of soap plaster.

NOTE.—Adhesive plaster (U. S. P.) consists of rubber 20, petrolatum 20, with lead plaster 960 parts.

### BELLADONNA AND BORIC ACID.

| | | |
|---|---|---|
| Extract of belladonna leaves | 30 | per cent. |
| Boric acid | 20 | “ |
| Plaster mass | 50 | “ |

Invaluable in excessive and fetid perspiration, subacute and chronic eczema, accompanied with obstinate itching; erythema, herpes, herpes zoster, and in neuralgia, and exalted and diminished sensibility of the skin; wounds, ulcers, burns and scalds, local itching spots, and in limited patches of vegetable parasites, especially ringworm and favus.

### CADE.

| | | |
|---|---|---|
| Oil of cade | 25 | per cent. |
| Beeswax | 25 | “ |
| Plaster mass | 50 | “ |

For limited spots of chronic acne, rosacea, eczema, psoriasis, and old ulcers.

### CAMPHOR AND OPIUM.

| | | |
|---|---|---|
| Powdered camphor | 10 | per cent. |
| Powdered opium | 5 | “ |
| Olive oil | 5 | “ |
| Plaster mass | 80 | “ |

Beneficial to employ in herpes, herpes zoster, boils, burns, frost-bites, fissured nipples, bed-sores, and dermatitis.

### CAMPHOR AND OXIDE OF ZINC.

| | | |
|---|---|---|
| Camphor | 5 | per cent. |
| Oxide of zinc | 40 | “ |
| Plaster mass | 55 | “ |

For chronic eczema attended with severe itching, erythema, and in irritable boils and carbuncles.

### CHRYSAROBIN.

| | | |
|---|---|---|
| Chrysarobin | 35 | per cent. |
| Plaster mass | 65 | “ |

Efficient for limited psoriasis, chronic eczema, chronic acne, and acne rosacea, and in old syphilitic and scrofulous spots on the skin.

### ELM.

| | | |
|---|---|---|
| Resin elm, strained | 50 | per cent. |
| Plaster mass | 50 | “ |

For wounds, ulcers, bed-sores, syphilitic and scrofulous spots, acne, rosacea, freckles, and chloasma.

### HYDRASTIN.

| | | |
|---|---|---|
| Hydrastin | 30 | per cent. |
| Plaster mass | 70 | “ |

Useful in chancroid, unhealthy and sloughing sores, cancerous growths, and excessive secretion of the skin.

### IODOFORM.

| | | |
|---|---|---|
| Iodoform | 40 | per cent. |
| Plaster mass | 60 | “ |

Appropriate and useful for chancre, chancroid, syphilitic and scrofulous spots, ulcers, and wounds.

### IODOL.

| | | |
|---|---|---|
| Iodol | 40 | per cent. |
| Plaster mass | 60 | " |

Efficient for syphilitic, scrofulous, and tuberculous patches, chloasma, lentigo, scars, and lupus.

### LEAD.

| | | |
|---|---|---|
| Oxide of lead (litharge) | 30 | per cent. |
| Plaster mass | 70 | " |

Useful for fissured nipples and other varieties of eczema, impetigo, erythema, burns, and frost-bites.

### LEAD AND OPIUM.

| | | |
|---|---|---|
| Lead oxide (litharge) | 30 | per cent. |
| Extract of opium | 10 | " |
| Plaster mass | 60 | " |

Is beneficial in all irritable conditions of the skin, bed-sores, various forms of ulcers, and carbuncles.

### MERCURIAL.

| | | |
|---|---|---|
| Red oxide of mercury | 50 | per cent. |
| Plaster mass | 50 | " |

Valuable in syphilitic patches, especially in chronic cases; pigmentary deposits, particularly chloasma, or yellowish-brown or blackish spots on the skin; freckles, syphilitic and scrofulous ulcers, enlarged glands, elephantiasis, and indurated acne spots.

Deficiency of pigment, keloid scars, lupus, and in hardened and infiltrated spots of the skin, which result from many skin affections, especially boils, carbuncles, inflammation of the hair-follicles, eczema, and small-pox.

### OXIDE OF ZINC.

| | | |
|---|---|---|
| Oxide of zinc | 40 | per cent. |
| Plaster mass | 60 | " |

Serviceable in subacute and chronic eczema, acne, seborrhea, herpes, ulcers, and boils.

### OXIDE OF ZINC AND WHITE PRECIPITATE.

| | | |
|---|---|---|
| Oxide of zinc | 30 | per cent. |
| White precipitate | 15 | " |
| Plaster mass | 55 | " |

Available for irritable syphilitic and scrofulous patches and chronic eczema.

### PHYTOLACCA AND BELLADONNA.

| | | |
|---|---|---|
| Phytolacca extract | 20 | per cent. |
| Belladonna leaves extract | 20 | " |
| Plaster mass | 60 | " |

Serviceable in obstinate eczema, ulcers, burns, dermatitis, by arresting and overcoming tendency to inflammation, particularly of the female breast.

### SALICYLIC ACID.

| | | |
|---|---|---|
| Salicylic acid | 25 | per cent. |
| Plaster mass | 75 | " |

Useful for eczema of the palms of the hands and soles of the feet, and in all thickened conditions of the skin occurring in the course of psoriasis, scrofuloderma, erysipelas, boils and carbuncles, local varieties of hyperidrosis and bromidrosis.

### SALICYLIC ACID AND CANNABIS INDICA.

| | |
|---|---|
| Salicylic acid | 25 per cent. |
| Extract of cannabis indica | 20 " |
| Plaster mass | 55 " |

For corns, horns, warts and callosities, acne, rosacea, chronic eczema, and psoriasis.

### SALICYLIC ACID AND CREOSOTE.

| | |
|---|---|
| Salicylic acid | 25 per cent. |
| Creosote | 5 " |
| Plaster mass | 70 " |

Useful in lupus, chronic ulcers, excessive and fetid perspiration.

### SUBIODIDE OF BISMUTH.

| | |
|---|---|
| Subiodide of bismuth | 30 per cent. |
| Plaster mass | 70 " |

Useful in syphilitic and scrofulous spots, acne, rosacea, chloasma, freckles, and all pigmentary deposits; orchitis, bubo, and all enlargements of glands; indurated patches following inflammation of the skin.

### THYMOL IODIDE.

| | |
|---|---|
| Thymol iodide | 25 to 40 per cent. |
| Plaster mass | 75 to 60 " |

Serviceable in chronic eczema, psoriasis, acne, rosacea, syphilis, scrofuloderma, lupus, and tuberculosis of the skin.

### ZINC.

| | |
|---|---|
| Chloride of zinc | 25 per cent. |
| Glycerin | 5 " |
| Plaster mass | 70 " |

Valuable in epithelioma, lupus vulgaris, and in all old syphilitic and scrofulous ulcers.

## *MEDICINAL SOAPS.*[1]

**Amber Soap** (*Eau de Luce*).—A liquid soap, which has as its chief ingredients tincture of oil of amber and balsam of Gilead, with water of ammonia and oil of lavender.

Used in enlarged glands, moles, warts, etc.

**Alum Soap** (*Sapo Aluminis*).—Ten per cent., or 168 grains (10.08 gm.), alumen (potash alum).

Alum soap is most useful in hyperidrosis, seborrhea oleosa, and pustular eczema. It is very efficient in all indolent conditions of the integument, such as occur in lupus, cancer, ulcers, and in scrofulous and syphilitic skin affections.

**Arnica Soap** (*Sapo Arnicæ*).—Ten per cent., or 168 grains (10.08 gm.), extract of arnica.

Arnica soap is very good to use in sore nipples, abrasions, wounds, bruises, boils, carbuncles, and many of the pustular skin affections.

**Balsam Soap.**—Five per cent., or 84 grains (5.04 gm.) of balsam of Peru.

Used in indolent ulcers, sinuses, abscesses, etc.

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[1] Each soap referred to should be divided into pieces or cakes that have an average weight of three and a half ounces, or 1,680 grains (100.80 gm.). See paper by the author on "Toilet and Medicinal Soaps." The Medical Bulletin, May, 1892.

**Benzoin Soap.**—Containing five per cent. gum benzoin.

A good soap for the toilet, seborrhea sicca or dandruff, intertrigo or chafing, bromidrosis and hyperidrosis or fetid and excessive sweating.

**Boroglycerin Soap** (*Sapo Boroglycerini*).—Ten per cent., or 168 grains (10.08 gm.), 50-per-cent. solution (glycerite of boroglycerin, U. S. P.).

It is valuable for cleansing wounds, uclers, suppurating, sloughing, or gangrenous surfaces, lessening inflammation, and preventing the action of atmospheric germs; in general and local pruritic conditions of the skin, in acne, and in seborrhea.

**Camphor Soap** (*Sapo Camphoræ*).—Ten per cent., or 168 grains (10.08 gm.), camphor.

It is most frequently used for the relief of pruritus that attends eczema, chilblains, and other irritable affections of the skin.

**Chamomile Soap** (*Sapo Anthemidis*).—Ten per cent., or 168 grains (10.08 gm.), extract of chamomile.

It is an excellent soap to use in intertrigo or chafing, and in dermatitis and seborrhea, while it is particularly valuable both for its medicinal virtues and aromatic odor in all conditions of excessive secretion and ill-smelling sores.

**Chamomile and Sulphur Soap** (*Sapo Anthemidis Sulphurisque*).—Ten per cent., or 168 grains (10.08 gm.), extract of chamomile; 5 per cent., or 84 grains (5.04 gm.), washed sulphur.

It is beneficial in seborrhea sicca, loss of hair, and in acne.

**Creolin Soap.**—Containing 5 per cent. creolin. (Said to be an emulsion of cresol with resin soap.)

Valuable in eczema, especially upon the scalp, around the genital organs, scabies or itch, pediculosis or lousiness, and in impetigo contagiosa.

**Creosote Soap.**—Containing 5 per cent. creosote.

A beneficial soap to use in wounds, ulcers, paresthesia or pruritus, seborrhea oleosa, bromidrosis, and hyperidrosis.

**Elder-flower Soap** (*Sapo Sambuci Florum*).—Ten per cent., or 168 grains (10.08 gm.), of elder flowers.

Used in intertrigo, rosacea, sunburn, etc.

**Ergot Soap** (*Sapo Ergotæ*).—Ten per cent., or 168 grains (10.08 gm.), extract of ergota.

Used in eczema, acne, rosacea, etc.

**Eucalyptol Soap** (*Sapo Eucalyptoli*).—Five per cent., or 84 minims (5.04 gm.), oil of eucalyptus.

It is a useful disinfectant application to all foul-smelling wounds and ulcers. In bromidrosis or fetid perspiration, it is very efficacious.

**Glycerin Soap** (*Sapo Glycerini*).—Fifteen per cent., or 252 grains (15.12 gm.), glycerin.

Used for roughness of the skin, chaps, pityriasis, etc.

**Hydroxylamine Soap.**—Containing 5 per cent. hydroxylamine hydrochloride.

For chronic eczema, psoriasis, acne, rosacea, seborrhea, and lupus.

**Iodine Soap** (*Sapo Iodi*).—Three per cent., or 50⅖ grains (3.02 gm.), iodine resublimated.

Used in syphilitic and scrofulous skin affections, old granulations, etc.

**Iodide of Sulphur Soap** (*Sapo Sulphuris Iodidi*).—Three per cent. iodide of sulphur, 50⅖ grains (3.02 gm.) in a cake.

Used in acne indurata, chronic ulcers, freckles, yellowish-brown or blackish patches on the skin, etc.

**Iodoform Soap.**—Containing 5 per cent. iodoform.

Serviceable in wounds, bruises, burns, frost-bites, abscesses, pustular eczema, impetigo, scrofuloderma, syphilis, and in old ulcers.

IODOL SOAP.—Containing 5 per cent. iodol.

Useful in the same diseases enumerated under iodoform soap.

KINO SOAP (*Sapo Kino*).—Ten per cent., or 168 grains (10.08 gm.), extract of kino.

Used in eczema, rosacea, ulcers, etc.

LANOLIN SOAP.—Containing 2 per cent. purified wool-fat and 3 per cent. olive oil.

An excellent toilet soap.

LEAD SOAP (*Sapo Plumbi*).—Three per cent., or 50⅖ grains (3.02 gm.), acetate of lead.

Used in boils, carbuncles, abrasions, bed-sores, etc.

MENTHOL SOAP.—Containing 5 per cent. menthol.

An excellent soap for paresthesia or pruritus, especially involving the axillary, anal, and genital regions.

NAPHTHOL-SULPHUR SOAP (*Sapo Naphtholi Sulphurisque*).—Three per cent., or 50⅖ grains (3.02 gm.), betanaphthol, 10 per cent., or 168 grains (10.08 gm.), washed sulphur.

Used in scabies (itch), pediculosis (lousiness), insects of all kinds on the skin, eczema, psoriasis, seborrhea, hyperidrosis, bromidrosis, etc.

NAPHTHOL SOAP (*Sapo Naphtholi*).—Five per cent., or 84 grains (5.04 gm.), betanaphthol.

It is useful for animal parasites. The bite and sting of many insects and animals may often be cured or relieved by its use. It acts well in eczema, psoriasis, pityriasis, ichthyosis, and offensive discharges from the skin. Fetid perspiration is not only controlled, but often cured by its use.

PHENOL SOAP (*Sapo Phenolis*).—Five per cent., or 84 grains (5.04 gm.), phenol. It is excellent for chronic eczema and psoriasis.

RESORCIN SOAP.—Containing 5 per cent. resorcinol.

For seborrhea, pediculosis, scabies, chronic acne, rosacea, eczema, psoriasis, hyperidrosis, and bromidrosis.

SALICYLIC-ACID SOAP (*Sapo Acidi Salicylici*).—Four per cent., or 67⅕ grains (4.20 gm.), salicylicic acid.

It is an admirable soap for toilet purposes, and has proved serviceable in those thickened conditions of the epidermis that occur in the plantar, palmar, and extensor surfaces. Sycosis and pustular eczema are generally benefited by its use. It is likewise serviceable in fetid perspiration and all foul-smelling wounds or sores.

SALOL SOAP.—Containing 5 per cent. salicylate of phenyl.

Valuable in the treatment of chronic eczema and seborrhea, especially around the genital organs.

SUBLIMATE SOAP (*Sapo Hydrargyri Chloridi Corrosivi*).—One per cent., or 16⅘ grains (1.008 gm.), corrosive sublimate of mercury.

It is a valuable soap in animal parasitic diseases, such as pediculosis or lousiness, scabies or itch, and for destroying all varieties of insects that may infest the body. Freckles, pigmentary deposits, especially chloasma, or yellowish-brown or blackish patches on the skin, are greatly relieved, and sometimes removed by its employment. It is an effective soap in all kinds of itching of the integument. It is likewise markedly serviceable in the various syphilitic skin eruptions.

SULPHUR SOAP (*Sapo Sulphuris*).—Ten per cent., or 168 grains (10.08 gm.), washed sulphur.

Used in acne, rosacea, etc.

**TANNIN SOAP** (*Sapo Acidi Tannici*).—Three per cent., or 50⅖ grains (3.02 gm.), tannic acid.

Used in seborrhea oleosa, excessive sweating, ulcers, granulations, etc.

**TANNIN-BALSAM SOAP** (*Sapo Tanno-Balsamicus*).—Two per cent., or 33⅗ grains (2.10 gm.), tannic acid; 5 per cent., or 80 grains, balsam of Peru.

Used in wounds, ulcers, chilblains, etc.

**THYMOL SOAP.**—Containing five per cent. thymol iodide.

For chronic eczema, psoriasis, acne, rosacea, seborrhea sicca, and indolent ulcers.

**THYMOL SOAP** (*Sapo Thymoli*).—Three per cent., or 50⅖ grains (3.02 gm.), crystallized thymol.

Used in ulcers, wounds, abscesses, sinuses, pustular eczema, etc.

**TURPENTINE SOAP** (*Sapo Terebinthinæ Compositus*).—This soap has been known as Starkey's, and is composed of equal parts of potassium carbonate, oil of turpentine, and Venice turpentine.

Used in chilblains, syphilis, psoriasis, etc.

**TAR SOAP** (*Sapo Picis Liquidæ*).—Ten per cent., or 168 grains (10.08 gm.), tar.

Tar soap is valuable in chronic eczema, psoriasis, and ichthyosis.

**WINTERGREEN SOAP** (*Sapo Gaultheriæ*).—Three per cent., or 50⅖ grains (3.02 gm.), oil of gaultheria or birch.

Used in eczema, psoriasis, lichen, acne, etc.

**WITCH-HAZEL SOAP** (*Sapo Hamamelidis*).—Ten per cent., or 168 grains (10.08 gm.), extract of witch-hazel.

Used in fetid perspiration, eczema, loss of hair, etc.

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